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THE

# INDIAN FORESTER;

## A MONTHLY MAGAZINE

OF

## FORESTRY,

## AGRICULTURE, SHIKAR & TRAVEL

EDITED BY

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THE

# INDIAN FORESTER.

Vol. XIX. ] November, 1893. [ No. 11.

## A Tour in Jaunsar.

On the march from Mundali to Kathiyan we passed through some second class forest in the Ban oak zone which is burnt every year and used as a grazing ground ; and then we came to a small patch of temporary cultivation in which the trees are lopped and the branches strewn on the ground and burnt, and the ashes ploughed in ; *khil* is the local name for this system.

Along the stream at the bottom of the valley, we noticed many new species among which *Cedrela Serrata* and *Quercus annulata* were the most important.

With regard to burning the 2nd class forest, we read in the Journal of 1891 as follows :—

"A greater part of the 2nd class forest below Mandali had 'been fired intentionally by the villagers. This procedure is allow-'ed by the Forest Department, apparently as the villagers consider 'it necessary in order to improve their grazing. This, however, it 'does not do, as has been conclusively proved in Madras. In 'reality by firing the grass, most of the delicate annuals such as '*Panicum Oplismenus*, *Isachne*, *Poa*, *Eragrostis*, *Festuca*, which 'are especially good for cattle, are destroyed, while the coarser kinds 'such as *Andropogon Nardus* and *Schœnanthus*, *Apluda aristata*, '*Chrysopogon sp. sp.* and *Anthistiria ciliata* which are not so good 'for fodder, and of which only the young shoots are eaten, are en-'couraged."

The climb up from the valley, through village lands, to Jaknilani is steep and hot.

### Kathiyan Forests.

The area of the Kathiyan forest is 608 acres. The whole of the forest was burnt in 1865 by the neighbouring villagers of Chajál to propitiate their deity on account of a severe epidemic of small pox which visited them. The forest has been preserved from fire since 1870, and in 1870-71 the 1st and 2nd class trees which had been killed by the fire of 1865 were felled and converted into sleepers ; about 2,000 trees of each class were removed, and these yielded 10,000 broad guage and 10,000 metre guage sleepers. The sleepers were carried by men 12 miles to the Tons river and from thence floated singly to Dakhpathar.

The price then received for a broad guage sleeper at Delhi respectively was Rs. 4 and for a metre guage Rs. 2-8; the price now received is Rs 2-8 and Re. 1-9 respectively.

Protection from fire has resulted in extensive reproduction of blue pine and deodar. On the south side of the hill above the village of Chajál, the deodar is quite as numerous as the blue pine, and in the struggle has held its own; the young saplings are growing quite as fast as the blue pine and have a healthy appearance.

On the north side of the hill it is probable that deodar at the outset was not so numerous, and thickets of blue pine 25 to 30 feet high have sprung up and suppressed the deodar. A casual observer might suppose that the deodar seedlings are much younger than the pine, but a careful examination of the annual rings of the former shows unmistakeably that they are of the same age; the two species sprang up together shortly after the commencement of fire-conservancy, and the deodar has lingered on under the cover of the blue pine, but has not prospered. Operations to clear away the pine were commenced in 1886, but they were not carried out with sufficient vigour and boldness. Some oaks and other inferior species about 300 in number, were also girdled. In 1888, a party of students worked for ten days, and cleared away about 5,000 blue pine, girdled 2,500 oaks and other species, and liberated nearly 9,000 deodar seedlings, and though this operation was carried out rather late in the day, it is hoped that the deodar will prosper under the increased light given to them, and will now shoot ahead. The whole area has now been done, but it is essential to bear in mind that the place must be revisited every three or four years, and the operation, if necessary, repeated. We have seen that deodar is capable of existing under cover for many years; but it is quite possible that some of the original deodar seedlings have already disappeared. We must acknowledge, however, that, with one or two exceptions, we do not find any distinct proofs of this.

The deodar seed bearers were chiefly on the ridge at the top of the forest, whereas blue pine seed bearers were scattered about all through the forest, this fact mainly accounts for the preponderance of blue pine in the thickets on the lower slopes. The soil which is a deep loam may also have favoured the latter species.

"On the top of the ridge above the bungalow we inspected the 'patch of deodar reproduction marked out by the forest students in '1887; its area is 550 square feet and it then contained the following 'saplings:—deodar, 105: blue pine 35; spruce fir, 6; other species '2. In the middle is an old parent deodar tree, from which probab-'ly most of these young deodar have sprung."

This year we counted 97 saplings in the area, which would give about 7,682 per acre, the number in 1887, being about 12,120 per acre, an example of natural thinning. The number of deodar seedlings in a good seed year, that come up immediately under a parent tree is sometimes very large. We counted on one square

foot as many as 83 which had just germinated ; and in the Lambatach forest in 1888 we made the following remarks regarding natural reproduction of deodar and blue pine together, which are interesting as throwing light on the origin of these blue pine thickets :—

"On a grassy slope near the fire-line below "Dumbleton's" 'house, we counted the seedlings on a patch 10 feet by 10 feet and 'found 46 deodar of on average height of one foot, and 14 blue pine 'of an average height of nine inches. The deodar was about seven 'years old and the blue pine all ages from two to six : this would give 'about 20,000 deodar and 6,000 blue pine per acre. There were a 'good many deodar seed-bearers in the vicinity, which accounts for 'the large proportion of deodar seedlings but it is quite possible that 'in a very few years these 14 blue pine would completely suppress the '46 deodars. Hence it is absolutely necessary to watch such a crop 'from the very outset, and to clear away the pine as soon as they 'begin to get the upper hand of the deodar. Lower down on the 'same slope, the young stock is almost entirely composed of blue 'pine, and here it is probable that, at the beginning, there were very 'few deodar seedlings, because the locality is much further from the 'parent trees."

Near the Camp we inspected the result of the girdling of blue pine in 1888, and found that the girdled trees were quite rotten, and the average length of last year's shoot in the deodar was 13½ inches. The pine girdled in 1891, are now dying, their leaves being quite yellow. In 1892, we measured the lengths of the annual shoots of deodar of the last four years, in an area where the pine had been girdled, and found them to 6′, 7′, 9′ and 9·1′ respectively These observations, as far as they go, tend to prove the beneficial effect of giving the deodar more light.

*Tapping Chir Pine for Resin.*

For a full account of these works the reader is referred to the Appendix Series of the *Indian Forester*, "Resin and Turpentine from Indian pines."

The following is a brief history up to date :—In 1884, 20 Chir trees were tapped on the Kumaon principle, *i.e.*, a nick is cut deep into the tree and the resin is allowed to accumulate at the bottom of the hollowed out nick, and is collected from time to time. The nick is 18 inches high, 12 inches wide and 41 inches deep, at the base. The trees were tapped from April to November, and the yield was as follows :—10 trees in the Dharmigadh yielded 30 seers, and 10 trees in the Chattragadh yielded 36 seers of crude resin.

Resin tapping works on a larger scale were started in April, 1888. They were of an experimental character, and the cost of extraction was consequently high and the yield of crude resin small.

1024 Chir and 501 Kail were tapped in the Bogar, Malon, Himus and Kathiyan blocks, 2,873 blazes in all being made, or nearly

2 on each tree. The work was begun by Dr. Warth and some forest students, and afterwards carried on by the local establishment.

Incisions were made 12 inches long and 6-9 inches wide. The cuts were freshened once a fortnight and at the end of November, 1888, were from 24 to 30 inches long, and 2 or 3 inches deep at the lower end.

The yield of resin in this year was 107 maunds or nearly 3 seers per tree.

In 1889, 1073 Blue pine and 3,215 Chir were tapped in the same forests, the yield being 2¾ seers and 6 seers respectively.

In 1890, 473 Blue pine and 115 Chir were abandoned as exhausted; and 1,540 Blue pine and 3,100 Chir were again tapped, but not worked to their full capacity, the cuts being freshened only once or twice a month. The yield was 37 seers of Chir resin, and 1 seer of Blue pine resin per tree.

In 1891 and 1892 the work was continued and there are during the present year 5,000 trees, all Chir, undergoing the process of being tapped.

The present system of tapping, which is adapted from the French, is as follows:—the outer bark is first of all removed for a space ef several feet in height and about two feet in breadth; then an incision is made near the base of the tree, one foot long, 4 inches wide, and 1½ inches deep, the instrument used being the native adze A gouge chisel is then driven into the tree just below the botton of this incision, into the curved cut thus made a strip of zinc 5 inches long and 1½ inches wide, is driven by the handle of the gouge; this forms a lip which guides the resin into the pot placed below to receive it. This vessel is supported by a nail, and a piece of string passing round and fastened to nails on either side.

The pots are now made locally of unglazed earthenware at a cost of Rs. 2-8-0 per 100, or about 5 pies each. They were at first made of zinc, but these were soon abandoned, as they cost eight annas each, and were apt to be stolen by the hillmen.

The cut or blaze is freshened every eight days by taking off a thin strip at the top, ¼ inch thick and about 8 or 9 inches long; we examined several of these cuts immediately after they had been freshened and found the resin oozing out in bead like drops from 45 and 18 annual rings respectively. In the Chir pine, we believe, that the whole of the sapwood is capable of producing resin, but there are reasons for not making the cuts deeper, one being that it would require a very long time for a deep cut to heal over. The trees are frequently of large girth, and two cuts are made on each tree. At the end of the working season, the cut is about 2 feet high, and at the beginning of the following season, the pot is removed to the top of the old blaze and the work continued as before. Some trees are now being tapped, as an experiment, for the fourth and fifth year, but generally speaking, three years is considered sufficient for one continuous tapping. The tree is then abandoned and allowed rest.

The pots are covered with pieces of Chir bark to prevent foreign matter falling into them, but these are frequently blown off and we noticed that much of the resin was mixed with pine needles, chips, bits of bark, &c, which has to be strained out afterwards.

The resin is collected every eight days by a distinct set of men and taken to Kathiyan where it is stored in wooden tanks From time to time it is packed and soldered up in old kerosine oil tins, and then sent on mules to Chakrata, on its way to Dehra where it is distilled.

During the season of 1892, the outturn of resin was 594 maunds and the cost of collection and carriage as far as Chakrata was as follows :—

| | | | |
|---|---|---|---|
| (1) | Tapping and collecting ... | | Rs. 722 |
| (2) | Purchase of material ... | ... | „ 21 |
| (3) | Soldering tins .. | ... | „ 52 |
| (4) | Carriage to Chakrata ... | ... | „ 76 |
| | | | Rs. 871 |

Or about Rs. 1-7-5 per maund, a sensible reduction on the cost of the previous year.

The trees yielded 4⅝ seers each in Bagur block, and 5¼ seers in Karun.

The future of this industry depends on the sale of the turpentine. At present the whole of the resin or colophony is taken by the Soap Works at Meerut, aud about two-thirds of the turpentine can be sold. Whenever the annual outturn of the turpentine can be disposed of, the tapping of the pines can be conducted on a larger scale. (Since the above was written, arrangements have been made for the sale of the turpentine to the N. W. Railway and it is almost certain that this industry will be largely developed.

## Kathiyan to Thadiar.

*17th May*—On this march, we proceeded along the Tons road, many portions of which are interesting from an engineering point of view. The average gradient of the road from Kathiyan down to Dharmigadh is 6° to 8° and we inspected the various bridges, retaining walls and railings, and witnessed some blasting of rocks to widen the road. Blasting is done by contract, the holes being made at a cost of 4 to 6 annas per foot, which includes everything, except the cost of the powder. As a rule, one chittack of powder is used for every 12 inches depth of hole, but the amount varies slightly with the hardness of the rock.

The student's attention was also called to the excellent natural reproduction in the lower portion of the Chir forests in the Tons valley, which had resulted owing to the area being protected from fire since 1885.

*The Tons Chir Forests.*

The following account of these forests is taken from the Journals of 1888 and 1891 combined.

Various fellings have been made from time to time in the Tons chir forests, the trees being marked by the Ranger or Divisional Officer and sold standing to contractors, who saw them up into scantlings and float them down to Dakhpathar in the Western Dún. They pay about Rs. 5-4 for a tree over six feet in girth.

In 1878 it was proposed that sleepers of the chir pine should be impregnated with creosote or with metallic salts, and that works for this object should be set up on the Jumna. A report was prepared by Dr. Warth on the subject of impregnation, (1) and the chir forests were inspected and surveyed by Mr. Smythies and a report on them submitted (2). But the railway Companies preferred deodar and the matter fell through. The question may, however, crop up again, when the deodar forests outside British territory have been exhausted and then the Tons chir forests will become important. As it is, there is such a great demand for chir timber that 4,000 first class trees could be sold every year. In 1879 it was estimated that there were nearly 200,000 chir trees above 6½ feet girth on the left bank on the Tons above Chattra, but perhaps one-quarter to one-half were too heavily branched to yield sleepers or Karis.

In 1881 three hundred chir trees were sold to Mr. Spread for for Rs. 3 each. These trees were 120 feet high and 12 feet girth, and were situated in the Khunigadh, close to the banks of the Tons ; 4 or 5 trees per acre were cut. Mr. Spread's venture was not a financial success, the resulting natural reproduction was however very good.

No more Chir trees were sold until 1887, when 300 trees were sold for Rs. 6 each from the same area, leaving about 8 trees per acre on the area. The trees were cut from this area as the young seedlings which had come up required more light.

In 1891, 800 trees with an average girth of 7 to 8 feet and at a distance of two miles from the river, were sold for Rs. 6-8 per tree. A market for Chir wood has been made, and the wood is in great demand in the Punjab.

The trees are converted into karis 11 feet long by 5″ × 4″ or 5″ × 5″, which are carried to the banks of the Tons and there stacked. The stacks are covered with mud to prevent the karis cracking and to allow them to season. The karis are floated down the Tons after the rains.

Besides the trees sold standing, trees are also converted departmentally, and the resulting karis sold by auction in September on banks of the Tons. The Chir forests Working Plan provides

(1). Memorandum on the establishment of a Factory for impregnating pine sleepers from the North-Western Himalaya with metallic salts (Government Central Branch Press, Simla, No. 484R A. and C )

(2). The Chir forests on the left bank of Tons river situated in Tehri Garhwal and Jaunsar Bawar, dated 25th August, 1897.

that a certain area annually shall be worked departmentally, the number of trees to be removed annually being left to the discretion of the Divisional Officer.

In 1889-90 four hundred and thirteen trees of various sizes were cut on and above the Tons road fireline, as it was found that the dry needles which fall annually were a great source of danger in the fire season.

In the earlier fellings of 1881, the following measurements have been recorded as to the reproduction :—

| | | | Ft. | In. |
|---|---|---|---|---|
| 1886 | 52 | seedlings, average height ... | 2 | 9½ |
| 1888 | 72 | " " " ... | 5 | 5 |
| 1891 | 250 | " " " ... | 7 | 2 |
| 1892 | 303 | " " " ... | 9 | 5 |

The girth of a mature tree measured was 7 feet 7 inches and the average distance from tree to tree, before the felling took place was 34 feet, giving roughly 40 trees per acre.

In the older fellings of 1881, a final felling could now be made as the ground is completely stocked with seedlings, and young chir requires an unlimited supply of light. The contrast between these fire-protected forests and those annually burnt, as along the Dharmigadh valley, is most striking. There is very little undergrowth in these forests, with the exception of sandan (*Ougeinia dalbergioides*) but the grass is long and thick, and fire-protection exceedingly difficult, as the grass is ready to burn in November. The fire season is therefore eight months long. The chir seedling has a wonderful power of shooting up again when burnt to the ground, and on the fire lines and other areas burnt, we noticed many instances of young shoots springing up from the collum buds. During this process, which goes on year after year, the root becomes thicker and stronger, and eventually the young seedling may become strong enough to resist a fire ; but there can be no question that many years' production is lost, and there is a chance of unsoundness at the base. Of all conifers with which we are acquainted, chir possesses the greatest power of withstanding fire.

The fireline along the Tons road is about 50 feet wide, and the upper limit is a two foot made path, from which the grass is burnt downwards when sufficiently dry. In order to lessen the danger of fire spreading in May and June when the needles of the pine fall, a belt of about 100 feet wide above the fireline, has been completely cleared of the trees and in consequence there is excellent natural reproduction on this belt, the young seedlings being now 6 to 8 feet high. These, in their turn, will shed needles, and they may have to be cut down in a similar manner. It is essential to keep the fireline quite cleared of all inflammable matter during the entire season.

The valley of the Tons is rich botanical ground for the forest student, and many interesting species may be collected between Thadiar and the Khunigadh : among others *Cinnamomum Tamala* which yields the "dalchini" of the bazárs.

# Fuel Supply Works in Naini Tal.

Readers who may have resided in Naini Tal will be interested in a revised scheme proposed by the Conservator, Central Circle, in July, 1893, for the supply of fuel by Departmental Agency to the Naini Tal Settlement, which received the sanction of Government in September and comes into force on the 1st January, 1894.

For some years the firewood supply of Naini Tal was met by the collection by the *Jhampan* bearers of the residents—of dry wood which had accumulated in the neighbouring forests—who were licensed for the purpose at eight annas a head a month. In due course, the supply of dry wood was exhausted, and the *Jhampanies*, with licenses to collect what was not to be found, began to cut green wood, and continued to do so in spite of numerous prosecutions and punishments. Then certain trees were girdled and others cut in order to provide dry wood, and eventually the system of providing green wood in licenses at one rupee a head a month was sanctioned by Government and came into force during the current season.

The Conservator, after carefully going into the question, represented that this system was as faulty and wanting in permanency as were the earlier arrangements, and that it, too, must come to an end, and in the meantime result in the destruction of the forests within easy reach of the Settlement, upon which the *jhampanies*, consistently with their other duties, can draw. This conclusion was based on the following figures :—

Monthly wood tickets as issued at present are as follows :—

| | | | |
|---|---|---|---|
| 1st April to 31st October | ... | ... | 3,000 |
| 1st November to 31st March | ... | ... | 300 |
| | Total | .. | 3,300 |

It was estimated that each ticket holder brings in 25 maunds a month, of which 10-12 maunds are delivered to his employer, a little is used, and 10-12 maunds are sold at a not lower rate than 4 annas a maund. The result is that 82,500 maunds of fire wood are removed from the forests, the resident obtains 10-12 maunds for a rupee, and the jhampani profits to the extent of Rs. 2-8 to Rs. 3 per month by the sale of wood. With regard to the quantity of fire-wood available, the Conservator worked out the areas set apart within the radius to which *jhampanies* can go, and found that they correspond roughly to 1,600 acres of completely stocked forest. The blanks could only be estimated and an arbitrary co-efficient of density applied, which was either taken from the Working Plan, or adopted from Conservator's own inspection of the areas,

but the result may be accepted, that at least five times the area in its present condition, would be necessary to meet the demand which might probably be taken at a round figure of 100,000 maunds, rather than at 82,500.

It was thought that the residents of Naini Tal could not reasonably expect to obtain their wood, at the sacrifice of all the adjoining forest, at 10 and 12 maunds to the rupee, while the same wood was being sold by their *jhampanies* in the Bazar, and even in their own compounds, at 4 maunds, and should a supply of good, dry wood be made available for them at about that rate, the Conservator was of opinion that they could have no just ground for complaint.

The pay of the *jhampani* is, at present, five rupees a month; but by the benevolent custom which has grown up and enabled him not only to supply his master with cheap fire-wood, but also to retail at his own price some 40,000 maunds of wood (his only title to which being that he has cut and carried it), he supplements his pay by 2½ or 3 rupees a month, and thus receives a total of 7½ or 8 rupees a month. Now, it cannot be denied that this is an extravagant price, and in excess of that ruling in other Hill stations, and when it is considered that it is paid by the gradual and certain denudation of the forests in the neighbourhood, the Conservator had no doubt it would be admitted that the time had come to make other arrangements and to bring the *jhampanies'* pay to a level with that of other unskilled labourers.

The proposal submitted by the Conservator was to abolish the system of issuing tickets and to establish four or five depôts at which the Forest Department should undertake to have on sale the requisite 100,000 maunds of fire-wood at Rs. 20 per 100 maunds. This would enable the Department to fell in suitable places at a distance beyond the radius within which the *jhampani* could go for his load and so to assure a constant supply and the maintenance of the forest.

The effect of this would be to (1) take away the *jhampanies'* perquisite in wood and so reduce his salary to Rs. 5, and (2) to give an ample supply of dry wood of good quality at about, or somewhat less than the rates now prevailing in the settlement, and residents could not reasonably complain of such a rate.

The old system was very tersely described by our friend and colleague, Mr. Fernandez, in his Working Plan report "as a premium for the European residents to entertain an army of liveried *jhampanies*," and its abolition is distinctly a step that should have been taken long ago.

# Forest Administration in Oudh.

Given a long narrow strip of forest bounded on all sides with cultivation; burden the area with concessions in free produce limited to all villages within three miles of forest boundary but otherwise undefined; permit the concessionists to remove the free produce in such form and from such localities as best suits them; allow their cattle in any number to roam through the area, and what will be the condition of that forest after 25 years? The local administration of the Province of Oudh conceived in 1865 the idea that it was necessary to encourage cultivation and recoup the tenantry for the loss in crops and health consequent on proximity to the forests, by making certain concessions to the inhabitants of the country in the neighbourhood of State Reserves; and by executive order, ruled that all villages within 3 miles of the forest boundary might receive free produce for domestic and agricultural requirements and graze their cattle at preferential rates. For eleven years these orders remained in force without registration of villages, without definition of the amount of free grants or of the number of cattle to be grazed, and without allotment of locality for the exercise of the privileges; that is to say, that any village whose boundary fell within the limit of 3 miles from State Forests, might graze any number of cattle and remove any amount of produce from any part of the area! In 1876 a special commission was appointed to enquire into rights and privileges in the Oudh Forests and generally into their management in relation to the agricultural necessities of the Province. This commission recommended the continuance of concessions granted in 1865 but suggested alterations in the method of the exercise of these grants, pointing out that a register of 3-mile villages should be drawn up, and that concessions of free produce should be defined on the basis of the number of 1st, 2nd and 3rd class houses in each village. The Local Government ordered the registration of villages but found that the definition of concessions was unnecessary and in consequence, the annihilation of such forests where the burden imposed was excessive, continued.

In the years that followed, successive Forest Officers reported on the state of the Bhinga forests of the Bahraich Division; that the soil was utterly impoverished and incapable of allowing reproduction to proceed; that the young growth was being destroyed by the unlimited extraction of poles by concessionists, that the vast herds of cattle, averaging 2 to every 1½ acres, prevented the growth of any grass or shrub; and that the standing crop of trees of the upper age classes was drying up or decaying for want of nourishment. Little by little the closure to cattle of a portion of the area was permitted by Government and the soil in these areas speedily responded to the advantages afforded, by becoming covered, first with grass, and then with a good undergrowth of inferior species, amongst which, however,

no sal seedlings were visible. The closure was, however, only partial. The undefined liberality of Government had brought about a state of affairs as unpleasant as unexpected. Cultivation had not, as was originally intended, increased; but the attractions of cheap grazing and free produce had created a class of cattle breeders in the neighbourhood of the forest who systematically evaded the payment of fees; and who owned, besides an immense number of domestic cattle, large herds of wild cattle whose progress through the forest was uncontrolled and from whose depredations neither the closed forest nor the cultivated area was free, moreover the closure of a percentage of the forest drove the concessionists, in their search for free produce, in still greater numbers, to the now restricted open area, and it seemed as if it was hopeless to continue to contend against these adverse conditions, and that there was no alternative but to acquiesce in the destruction of the forest over at least two thirds of the area of the Range. Such was the melancholy outlook in 1893 when the compilation of a series of Working Plans for the forests of the Bahraich Division was in contemplation, and the proposals for the working of the forests of the Bhinga Range were met by the Inspector General of Forests with the objection that no working of any forest in which undefined privileges existed could be sanctioned; namely, that if the demand on the area in grazing and produce was not fixed, it would be impossible to make any proposals for its working during a term of years which could be of value. The self-evident justice of this argument was, of course, accepted by the Local Government, who approved of the principle that Government may extend their liberality in concessions to any extent within the annual yield of any forest but not to such an extent as to involve its deterioration or destruction and after due enquiry and consultation the following orders were issued.

I. That the number of cattle admitted to the privilege of preferential grazing should be limited to 4 bulls and 4 cows for every 10 pacca bighas of land cultivated within the area of a 3-mile village.

II. That the amount of free produce should be limited to the amount required for the upkeep of the present number of 1st, 2nd and 3rd class houses in each 3-mile village; and for agricultural implements to an amount also based on the cultivated area of that village.

III. That one acre per head should be allowed for the grazing of privileged cattle and the rest of the forest be closed to grazing with power to alternate open and closed areas in future years.

IV. That free produce would be given under the supervision of the Department, and as the Department might direct, from any forest within 8 miles of a privileged village, thus permitting utilization of the wastage of improvement fellings at a distance.

V. That, unless any valid objection was brought forward, the wild cattle should be captured in Kheddahs and sold at once to persons residing at a distance from the forest.

Twenty eight years have elapsed since the grant of undefined concessions in 1865, and sixteen since the commission appointed by government advised the definition of these concessions. The present Government has stepped in to stay the destruction, already nearly complete, of a large area of State forests ; but the harm done in 28 years of unrestricted felling and grazing will not be rectified in a day. Twenty or perhaps thirty years hence, the forests of the Bhinga range will show a richer soil and a promising advance growth, and future Foresters will hardly realize to what a parlous state the area had been brought in 1893, owing solely to the omission to define the amount of the concessions granted and the method of enjoying them.

O. C.

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# Fire Protection in the Landes of Gascony.

The text of a Bill, which has recently been introduced into the French Senate with a view to organizing fire-protection in the Departments of the Gironde and the Landes, appears in a late number of the *Révue des Eaux et Forêts*. We give an abstract of the proposed law which may interest our readers.

After specifying the territorial limits to which the Bill relates, it is laid down that the kindling of fire shall be subject to administive rules sanctioned by the *Conseil d'Etat*. Article 3 provides that a person infringing any of the aforesaid rules shall be punished with fine varying from 20 to 500 francs, and may, in addition, be imprisoned for a period not exceeding five days. If the offender has previously been punished for a like offence, he may be imprisoned for from 3 months to 2 years ; and the responsibility of parents and masters for acts by minors or workmen is enforced. By Art. 4, forest guards, whether State or Communal, and any rural police officer may take cognizance of offences under the law. The most important portion of the Bill is that relating to fire-traces. Art. 5 provides that every owner of forest or *land* which has not been completely cleared of brushwood or dry timber, may be called upon by the owner of an adjoining estate of the same description, to open and maintain in good order his share of a common fire-line running along the dividing boundary. The width of this trace will be fixed by the proprietors or, if they cannot agree, by the Justice of the Peace, after consulting the Conservator.

By Art. 6 it is proposed to render obligatory the clearing of fire-lines, 20 metres broad, along every line of railway open for traffic, expenses being defrayed equally by the companies and the adjacent proprietors. The Bill also provides for the speedy preparation of a general scheme of fire-lines of public utility and lays upon the *Maire*, or the forest officials, as the case may be, the duty of directing fire-protection measures, especially when it is necessary to have recourse to counter-firing.

# Tour of the Coopers Hill Students in Germany.

The following account of the tour made by the Senior Forest Students from Cooper's Hill in the German Forests, may be interesting to some of your readers.

The tour was conducted under the able guidance of Dr. Schlich and the students were accompanied by Messrs. Reuther, E. Carr and Copeland of the Indian Forest Service.

We assembled at Frankfort on the Main at the end of April and on Monday, May 1st, accompanied by Forstmeister Henschell, started work in the forest belonging to this town. Sylviculture and valuation surveys occupied our time. We were introduced to the combination of agriculture with sylviculture. The system was in very general use a few years ago but is now only carried on in favourable localities, *i.e*, in those free from severe frosts.

On May 5th we arrived at the University town of Giessen; here several instructive days were spent in the company of Dr. Hesse, who showed us, amongst other things, some experimental plots of Oak, Beech and Spruce, where different degrees of thinning were being tested, also a very elaborate nursery and a fine museum.

The Spessart Mountains, Bavaria, were next visited and we were here joined for a few days by Sir D. Brandis. The Spessart is a hilly tract of country, bounded on the West, South and South East by the River Main It is divided into 12 Forest Ranges, four of which, Rothenbach, Rohrburn, Lohr, Waldaschaff, we examined from a sylvicultural point of view; the expeditions being conducted by Sir D. Brandis, who knows this part of Germany very well. Some magnificent oak and beech woods were seen here, the natural regeneration of the latter being so powerful that the former has to be protected against it when young On Sir Dietrich's departure we were divided into parties each making a description of a certain compartment. A thinning was also made here.

On our way to the Saxon Forests we stayed a day or two at Bamberg The woods here have suffered severely from very bad insect attacks and various interesting methods of prevention have been undertaken.

Schwarzenberg, Saxony, was reached on May 24th. The history of the Saxon Forests is interesting. At the beginning of the century, there was no Forest Conservancy at all. Rights of all sorts existed and the forests were in a deplorable state. In 1832 a law was passed empowering forest proprietors to demand a commutation of the rights which badly affected their lands. At present the management is excellent, as is shown by the fact that their revenue, after deducting *all* expenses = 41 marks per hectare. Insects give great trouble in these woods and owing to the attacks of *Hylobens abietis*, it is impossible to make large cuttings in any one spot Great ingenuity is shown in the formation and position of the cutting series so as to reduce this danger to a minimum.

On May 31st we went over the Fichtelberg in a snow storm and saw the effect of elevation on tree growth, and then had a passing glance at Austrian Forestry, on our way to Carlsbad. Here we were given a three days' holiday, re-assembling at Heidelberg on June 4th. From this well-known town we went to Vierheim, Hesse Darmstadt. The first attempt to employ agriculture for sylvicultural purposes was made here in 1810. It is now given up, however, the Scotch Pine being used as a nurse for the oak. The nursery here is curious. It is made under a shelter wood of Scotch Pine. These are left not only to shelter the beech seedlings but also that larger timber may be obtained.

Our tour in the Black Forest began at Baden-Baden on June 8th, sylviculture being the chief point of interest in the woods here.

At Herrenwies, which we reached on June 13th, a large amount of work was got through. After a tour in the woods, the parties made a description of three compartments and these, with some others included by Dr. Schlich, were formed into a neat and condensed working plan. One of the forest districts here, Forbach I, next to the Herrenwies dirtrict, belongs to several villages and a church. It is managed by the State Forest Officer From the proceeds of these communal forests, roads, school houses, &c., are built and all the expenses of the municipalities are defrayed, so that there are no local rates, taxes or school fees to be paid, certainly an ideal state to live in, especially as, in addition, a sum of money is received by each villager. From here we travelled by Schönmunzach and Fremdenstadt to Kippenheim, the home of a fine coppice with standards forest. Owing to its situation, in the fertile Rhine plain, the coppice at the age of 30 years attains a height of 30 feet which is exceptional for these climes, I believe. From here Staufen, E Black Forest, and Shönau were visited, the latter by tramping over the Belchen. The object of the latter was to notice the change in vegetation. This was most marked, beginning at the foot with fine well-grown forests and ending in a grassy mound (1415 metres.) On July 5th we left Schonau for Todtmoos, South Schwarzwald. In the 10 days we spent here, we built a charcoal kiln and saw it burnt and opened ; made a thinning and saw some heavy timber let down a steep slope. We also visited several Black Forest cottages and saw the manner in which the wood is worked up by the peasants in the manufacture of tubs, baskets, brushes, boxes, kitchen utensils, &c. The facility with which they manipulated spruce wood was wonderful to watch. Of course, it broke, instead of bending, in our hands.

On July 13th we proceeded to St Blasien where, at their Serene Highnesses' request, we were presented to the Grand Duke and Duchess of Baden.

Zurich, reached on July 16th was the last place visited. Here, under the able guidance of Forstmeister Meister, many things of interest to the forester were pointed out in the Siewald. Timber slides

and tramways were seen here in full working order, all the produce of the forests being worked up by the Forstmeister in his own factories before any sale is attempted. The machine for chopping up wood, turning out hatchet and broom handles, &c., were very ingenious and, in some cases, extremely simple.

This brought a most instructive and, thanks to the perfect management of Dr. Schlich, an extremely pleasant tour to a close.

E. P. S.

## II.—CORRESPONDENCE.

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# A Bureau de Recherches.

SIR,

Under the heading of a "Bureau de Recherches" the complaint of want of matter for publication is revived. Translations, official excerpts and occasional touring observations, occupy most issues of the "Forester," but interesting as these are, they are not attractive to all, and the pertinent question has been asked, "Is the *Indian Forester* popular ?" Without attempting to reply to the question, it is modestly suggested that increased popularity would spring from occasional energetic representations in the interests of the *personel* of the department. Room exists for fair discussion in this direction, due loyalty as Government servants being strictly observed, *e.g.*. D. P. W. and Bengal Police appointments corresponding to our 1st and 2nd Grade Deputy Conservators are valued Rs. 1,000 and Rs 900* each, against Rs. 900, and Rs 800 and carry with them recognized positions on the precedence list. Conservators' appointments compare unfavorably with similarly important ones in all the larger departments. A Conservator serving under a Local Administration occupies on on the precedence list, the position allotted to a second grade District Superintendent of Police. "Esprit de corps" has been prescribed as a forest maxim since Nancy produced such excellent specimens of Foresters, and this should induce much personal exertion to secure Forest Officers their due rights. By the way, your

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* Rs. 850, D. P. W.

very able correspondent "Velleda" does not encourage "esprit de corps," when his contempt for brother Foresters not "Nancy men and Germans," appears, as it did recently, in the case of untrained officers and, more veiled in your last issue, of Cooper's Hill men. A recommendation to use less gall in his incisive writings and a study of the Commander-in-Chief's last speech at the Staff College dinner at Simla, is humbly presented. "Union is strength" and even the untrained man has his good qualities. Every Forest Officer must congratulate you personally on the improved issues of the "Forester" since edited by you.

"BORDER."

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## Inspection Note on Coimbatore Forests.

DEAR MR. EDITOR,

I have just received the *Indian Forester* for September, in which, under the heading of "Inspection Notes on the Forests of South Coimbatore, North Malabar, etc," you make certain comments on the fact that the Conservator's remarks were largely annotated by the District Forest Officer of the former Division. Now, with reference to this fact, I beg to inform you that it was solely under the Collector's orders that the marginal notes and replies were made and initialled by me, the Acting District Forest Officer. Of course, I *did* recognise that such a procedure was obviously objectionable, and not only recognised it, but also pointed it out to the Collector. The Collector, however, was not of the same opinion and I, of course, obeyed his orders on the matter. Trusting you will give publicity to this letter in the next Volume of the *Indian Forester*, I beg to remain,

H. B. BRYANT.

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## Eucalyptus in Hoshiarpur.

DEAR SIR,

I see in your October number a note on the growth of Eucalyptus in Hoshiarpur, and this has brought to my mind a tree that I think ought to answer the purpose of stopping the erosion in the "Chos" of that district. I refer to the the *Acacia Melanoxylon*, which grows very rapidly, seeds plentifully, and sends up root-suckers. As it comes from hot and dry Australia, I think it ough

to thrive in the Punjab. It has been tried in the Ranikhet Reserve, successfully, as far as growth is concerned, but there it has to contend with snow which it cannot stand. A considerable quantity of seed could be obtainable from these, however, for experiment elsewhere. And, if for nothing else, I think it ought to do very well as a roadside tree, considering its large size, very quickly attained, its handsome and thick foliage, and its yellow blossoms.

Have the authorities finally given up trying to do anything for the "Chos" of Hoshiarpur?—or is it not too late to suggest that patches—by preference the heads of ravines—should be taken up and enclosed and sown with this tree?—If, moreover, extensive enclosure is not practicable, it seems to me it should at least be possible to take up patches here and there and when grown, to open them and take up adjoining patches—but, of course, lopping would have to be prohibited.

T.

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# Forest Fires in America and India.

DEAR SIR,

I send you an extract *re.* Forest fires in Sajmanbury. I found that Forest fires crossed a fire line burnt off to a width of 100 yards in Wynad. As a rule, in heavy grass forests, I have found a line of the above width sufficient, provided it has not been cleared on the slope of a steep hill with high grass or bracken below the line. In such places during a fierce fire in March, when a high east wind was blowing, I have seen dead leaves, bracken, &c., whirled 120 yards and more when flaming, into the protected Forest beyond. I have only once seen a Forest itself actually on fire. A planter had fired a big clearing on a steep slope, and the result was that all the trees on the upper margin of the clearing and for a depth of some two hundred yards beyond, were scorched and died out. Some years afterwards, when the undergrowth that sprang up after the trees were killed was very dry, some one set fire to it. I never saw so furious a fire as resulted. Huge trees burnt as they stood and fell over with a crash. The roaring of the flames could be heard a great distance and the sight at night was very grand. It gave one some idea of what a large Forest fire in a pine forest in America must be like.

 R. M.

# Forest Fires.

The occupants of a cyclone-pit can, says a writer in *Lippincott's Magazine* (U. S. A.) defy the fury of the storm, and Professor Herkimer, of Lima, Peru, has devised half a dozen different models of dwelling-houses which an earthquake may shake, but never break, while the conflagration of a large pine forest reduces all living things to the alternative of death or instant flight. During the Saginaw Bay fires of 1875, Squire Wirth, of Gladwin County, had surrounded his farm with a clearing from sixty to eighty yards wide, in the hope of saving at least the main building, but the conflagration overleaped that barrier at the first attempt; the dwelling-house, barn, and several stables caught fire almost simultaneously from a shower of flying sparks that swept ahead on the wings of the gale. There are plants (such as reeds and swamp-grass) that would extinguish a camp fire as effectually as a wet sponge would quench the flame of a rush-light; but the fierce heat preceding extensive woodland fires turns all vegetable products into fuel. Green leaves turn brown, saplings wrinkle and twist, the gray tassels of Spanish moss curl up and turn as black as horse-hair—all ready to blaze at the touch of the first spark. At a distance of three hundred yards from the actual flames of a forest fire near Rockwood, Tennessee, a Fahrenheit thermometer rose at once to the top of the scale—*i.e.* to 180 deg. above zero, and would have burst its tube the next minute if the experimenter, wrapped up in wet shawls, had not snatched it away in the nick of time.

"Sparks fell all around us," says an eye-witness of the recent highland fires in Northern Oregon, "and the air felt like 'a flame, though the distance to the next burning trees was about 'a quarter of a mile. I have been working in the open sunshine 'in Fresno County, California, when the thermometer stood at '108 deg in the shade, but the temperature of that sun heat 'seemed mild compared with that of the atmosphere all around 'us, except on the east side of the house, where the night wind 'felt almost cool. My brother, who had run out to snatch a 'saddle-blanket from the fence, came back with his hands looking 'as if blistered, though he had managed to dodge the sparks. 'The heat on the west side of the fence was enough to roast the 'rosin out of a pine rail, and must have exceeded 200 degs., 'judging from the fact that the thermometer on our side porch 'had risen to 162 deg. several minutes before the rooms became 'untenable, both on account of the temperature and of the prick-'ling odour of the smoke-clouds that penetrated through every 'cranny."

The damages caused by forest fires in the course of the last twenty years in the United States and British North America, has been estimated at eight hundred million dollars, a sum

which does not include the indirect loss from the destruction of game, insect-eating birds, &c, nor from the deterioration of climatic conditions, since tree-devouring fires are both a consequence and a cause of droughts. How completely and radically the vegetable life of large districts can be destroyed by intense heat, may be inferred from the fact that in the forest provinces of Brazil, where the woods are often burnt purposely in the interest of agriculture, an entirely new flora is apt to spring up on the *quemaderos*, or "charred" lands, as a proof that the original vegetation has been utterly annihilated. In Alleghany County, Maryland, dogwood roots were found scorched to a depth of 18 inches, though the ground around the demolished tree was not more than usually porous. A little ground squirrel was found dead in its burrow of about two feet of vertical depth; another in a somewhat deeper hole was still alive. but lethargised with heat or smoke. For most other animals the chances of survival are measured by the rate of speed. Instinct drives them towards the next clearings, and the proprietor of a large ploughed field gets often a chance to revise his estimate as to the animal population of an apparently uninhabited forest. Foxes, minks, woodchucks, rabbits, and weasles dart out of thickets that were supposed to harbour only lizards.

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## Compounding Offences in the C. P.

SIR,

I have, with regret, read the second Paragraph of your article on Page 386 of the 'Forester' which places a false construction on Paragraph 10 of the Resolution by the C. C. in which no censure has been conveyed, because the cases dealt with under section 67 had been trivial.

On the contrary the C. C. though considering that the administration in the Southern Circle had been harsher than in the Northern Circle, modifies this by an acknowledgment that the compensation clause had been applied to trivial cases only, that is such for which it was intended by legislation.

The correctness of this view is borne out by subseqnent correspondence on the subject in which the principle on which section 67 has been applied has been approved.

BERT. RIBBENTROP.

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**We are glad to publish the Inspector General's letter and to thank him for it; and also to make our apologies to Sir Antony Mac Donnell for our misinterpretation of para 10 of his Review of the C. P. Report. It is a great satisfaction to make sure that the principle on which Section 67 should be applied is really understood.**

**HON. ED.**

## III.—OFFICIAL PAPERS & INTELLIGENCE.

# The New Dehra Dun Forest School Rules.

### SECTION I.—CONSTITUTION AND STUDIES.

1. The School is under the administrative control of the Inspector General of Forests, who is assisted by a Board consisting of—

1. The Inspector General of Forests, *President* ;
2. The Director of Public Instruction, North-Western Provinces and Oudh ;
3. The Director of the School ;
4. One Conservator from each province (not more than three serving in any given year) ;
   with, as *Secretary*, the Assistant Inspector General of Forests.

2. The Superior Staff of the School consists of—

| | |
|---|---|
| 1. The Director,<br>2. The Deputy-Director,<br>3. & 4 Two Instructors,<br>5. The Vernacular Instructor, | assisted by the Forest Officers of the School Circle, North Western Provinces. |

The Conservator of Forests, School Circle, North-Western Provinces, will ordinarily be Director of the School. The Deputy-Director and two Instructors are officers of the Indian Forest Service on the Imperial List. The Vernacular Instructor is an officer of the Provincial Forest Service, also on the Imperial List.

3. The Director of the School is charged with (1) the general administration of the institution, including the regulation of the course of study under the arrangements prescribed by the Board of Control, subject to the sanction of the Government of India ; (2) the supervision of the School buildings, quarters and garden ; (3) the control of the accounts, and the conduct of correspondence.

4. *Courses.*—There are two courses ; one in English, the other in the Hindustani language. Each course lasts 21 months. The English course is that followed by the "Upper Class ;" the Hindustani course that followed by the "Lower Class." The first year's students are called "Juniors" ; the second year's students, "Seniors." In the English course students are prepared for the certificate in Forestry by the "Higher Standard" ; in the Hindustani course, for that by the "Lower Standard."

The subjects taught in these courses are the following, described in the School syllabuses :—

1. Forestry, including Sylviculture, Utilisation and Forest Working-Plans ; both theoretical and practical.
2. Mathematics—Elementary Arithmetic, Algebra, Trigonometry, and Mechanics ; in their application to forest questions.
3. Physical Science, including Chemistry, Physics, Physiography, Geology, Mineralogy and Soils.
4. Botany, both theoretical and practical; including the collection and preservation of plants.
5. Zoology—the classification of animals and the study of useful and dangerous species, especially of insects, including the collection and preservation of specimens.
6. Drawing, Surveying and Estimating ; as required for forest officers.
7. Forest Engineering. theoretical and practical.
8. Forest Law, the elements of Criminal Law, and departmental organisation.
9. Forest Accounts and Procedure.

5. *Terms.*—The terms of study are as follows :—

1st year—
- Rains term—July 1st to October 31st, in Dehra Dun.
- Winter term—November 1st to December 22nd, in camp.
- Vacation—December 23rd to January 5th.
- Spring term January 6th to March 31st, in camp.
- Hill tour term—April 1st to May 31st, in camp.
- Vacation—June 1st to 30th.

2nd year—
- Rains terms—July 1st to October 31st, in Dehra Dun.
- Winter term—November 1st to December 22nd, in camp.
- Vacation—December 23rd to January 5th.
- Spring term—January 6th to February 15th, in camp.
- Examinations, including survey test—February 16th to March 31st.

6. *Examinations.* —The School Examinations are :—

1. Monthly, to test progress and application.
2. Final.

The *Monthly Examinations* are usually held on the last two working days of each month, as the Director may order. The marks obtained at these examinations are counted for one-fourth of the aggregate at the Final.

The *Final Examinations* are held in March of the second year and the marks then obtained count for three-fonrths of the aggregate.

7. *Certificates.*—There are two certificates obtainable in each class, after the final examinations: a "pass" certificate and a "honours" certificate. The former is granted to students who obtain over 50 per cent. of the aggregate marks allotted to all subjects, provided this includes 50 per cent. of the marks allowed for each of the subjects of Forestry, Botany, Surveying, and Engineering. The latter is granted to students who obtain over 75 per cent. of the aggregate marks allotted to all subjects, including over 50 per cent. in each individual subject. These certificates are only granted on the orders of the Board of Control, who have authority to exercise their discretion in doubtful cases.

8. *Prizes.*—The School medals are awarded by order of the Board of Control, but only if "honour" marks (75 per cent.) have been obtained. Other prizes, whether given by Government or other donors, are also awarded by the Board of Control.

9. Should any student of the three categories enumerated in Rule 11, be unable (*a*) to appear at the final examinations, or, having appeared, (*b*) fail to pass those examinations, he will not be permitted to appear at any subsequent final examination, unless he follows a second time the whole course of instruction at the School, or, at the discretion of the Director, the second year's course.

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## SECTION II.—ADMISSION RULES.

10. The total number of students of each class who can be admitted into the School each year will be limited to such number as the Board of Control may decide, from time to time, can be accommodated in the School. The number of studentships to be allotted each year to the respective Provinces, as well as the number of nominations to be made by the Director, will, with due regard to the total prescribed by the Board of Control, be decided by the Director of the School before the 1st January, after consultation with the Provincial authorities as to their requirements and communicated to the Local Governments concerned.

### *A.—Upper Class.*

11. There are three categories of Students in the Upper Class—

(1) Private Students.
(2) Students already in the Government service.
(3) Students deputed by Native States.

12 *Private Students* comprise all those students who are at present without appointments in any Forest Service, and whose object it is, by becoming possessors of Forest School certificates, to obtain employment, either in the Forest Service of the Government of India, or in that of a Native State or some other owner of forest property.

(i) Candidates for admission to the Forest School as private students must not be less than 18 or more than 25 years of age, and their applications must be sent to a Conservator of Forests* through a Divisional Forest Officer of rank not below that of an Assistant Conservator of the 1st grade, or through a Collector or other district officer. Neither the Conservator, the Divisional Forest Officer, nor the Collector need belong to the forest circle or province in which the candidate seeks employment; but Divisional Forest Officers and Collectors may not forward to Conservators applications unsupported by the five certificates enumerated below, namely :—

*Conservator of Forests, Bengal Circle, at Darjeeling.
Conservator of Forests, Assam Circle, at Shillong.
Conservators of Forests, North-Western Provinces and Oudh—
School Circle, at Dehra Dun.
Central Circle, at Naini Tal.
Oudh Circle, at Naini Tal.
Conservators of Forests, Central Provinces—
Southern Circle, at Nagpur.
Northern Circle, at Jabalpur.
Conservator of Forests, Berar Circle, at Amraoti.
Conservator of Forests, Punjab Circle, at Lahore.
Conservators of Forests, Upper Burma—
Eastern Circle, at Mandalay.
Western Circle, at Mandalay.
Conservators of Forests, Lower Burma—
Pegu Circle, at Rangoon.
Tenasserim Circle, at Moulmein.
Conservators of Forests, Madras Presidency—
Northern Circle, at Bezvada.
Central Circle, at Madras.
Southern Circle, at Coimbatore.

(*a*) A certificate that the candidate is a "Native of India," within the meaning assigned to those words by section 6 of 33 Vict., Cap. 3. †

(*b*) A certificate of age.

(*c*) A health certificate, in the form prescribed by article 61 of the Civil Service Regulations, signed by the Civil Surgeon of the district in which the said Divisional Forest Officer's or Collector's duties lie, and testifying to the candidate's sound constitution, good vision and hearing, general physical fitness for a rough out-door life in the Forest Department.

(*d*) A certificate of respectability and good moral character from two two or more persons whose social or official position can be accepted as a guarantee of reliableness.

(*e*) A certificate from an officer of the Educational Department, of a rank not less than that of a Deputy-Inspector of Schools or the Head-master of a High School under public management, to the effect that the candidate's education appears sufficiently good to give hopes of his being able to pass the entrance examination.

† 'Native of India' means any person born and domiciled within the dominions of Her Majesty in India, or within the territories of Indian Princes tributary to or in alliance with Her Majesty, of parents habitually resident in India, and not established there for temporary purposes only. (Article 45, Civil Service Regulations.)

The last three certificates must bear date not further back than the 1st October of the year preceding that in which the candidate proposes to present himself at the entrance examination.

If any person, giving certificates as above under (*c*), (*d*) and (*e*), is in a position to mention anything more to the credit of the candidate than the certificates actually call for, he may do so.

(ii) Upon the receipt by the Conservator of any application in respect to which the preceding conditions shall have been observed, that officer may either accept or reject the application, without assigning any reason for so doing ; or he may require the candidate to produce other or better certificates in person before him.

(iii) Conservators may, at their option, test the fitness of a candidate who desires to enter the service of Government by practical work in the forests.

(iv) Those candidates who have been approved by the Conservator will be permitted, under his recommendation, to appear at the next entrance examination for the Forest School held in his circle.

(v) The *Entrance Examination* is held early in March each year, on such date as may be fixed by the Director, both at the Imperial Forest School and at such centres as may be fixed from time to time by Local Governments, and under such officers, Educational, Revenue, Forest or other, as may be appointed : provided that the date shall be communicated by the Director to Local Governments and Conservators on or before 1st January. The subjects of Examination are :—

| | | | Minima pass marks. | |
|---|---|---|---|---|
| 1. | English | Conversation ... | 50 | per cent. |
| | | Composition ... | 33 | „ |
| 2. | Arithmetic ... ... | | 40 | „ |
| 3. | Algebra, up to and including quadratic equations ... ... | | 40 | „ |
| 4 | Elements of Euclid, Books I to IV and Book VI ... ... | | 25 | „ |
| 5. | Mensuration—lengths, areas and volumes, with examples | | 25 | „ |

The examination papers on the above subjects will be forwarded by the Director, in sealed covers, to such officials as the Local Governments may direct, in the month preceding the examination.

(vi) A Local Government may lay down rules under which the number of candidates allotted, under Rule 10, to the Province for admission into the School, shall be selected from the number of passed candidates

In such rules due regard must be had to the place taken in the examination, but the Local Government shall not be debarred from preferring, for good and sufficient reasons, a passed candidate who may have taken a lower place in the list to one higher on the list ; provided that the Director may, after inspection of the papers of the selected candidates, place before the Local Government an objection to the admission of any of such candidates on the ground that he is below the required standard.

(vii) The Local Government may, if it thinks fit, exempt from the entrance examination any candidate who is a Bachelor of Arts, or who has obtained a degree or diploma of about the same standard, at any University in India or in the United Kingdom or in a British Colony, or at any educational institution to which the Government of India may extend the privilege : provided that such degree or diploma shall not give such candidate a preferential claim over any candidates who have passed the entrance examination and who may appear more eligible for the Forest Service.

(viii) Prior to the admission of a student, his parents or guardians must satisfy the Director that they are willing and able to defray the expenses of the student at the School These expenses are estimated to be not less than Rs. 735 for each student living in native fashion, and Rs 945 in the case of those living in European fashion (*vide* Rule 21). Of these sums, parents of guardians must deposit with the Director before the course commences, a sum of Rs. 126 in the case of native students and Rs. 168 in the case of European students, to meet the initial cost of uniform, books, instruments, stationery and camp-equipage (*vide* Rule 18), and, in addition, Rs. 50 as caution-money.

(ix) Local Governments may, on the recommendation of a Conservator or of the Director, and in exceptional cases, allow selected private students who have passed the entrance examination, a monthly stipend not exceeding Rs 50, to assist them through the School course ; provided that such selected private students previously execute an agreement binding themselves to serve the Local Government concerned (in the event of their obtaining the School certificate) for a period of not less than five years (*vide* Rule 17). Such monthly stipend may, in case of misconduct or unsatisfactory progress at the School, be reduced or altogether withdrawn at the discretion of the Director.

(x) The names of those private students who succeed in obtaining the School certificate will be entered by the Director in a register to be kept for that purpose, and the Conservators of those circles, in which the non-stipendiary private students may severally desire or be willing to serve, will be addressed by him with the view of obtaining appointments for such students. The Conservators concerned will, for this purpose, be furnished with the original certificates already referred to in clause (i) of this rule, the School certificates, and such other useful information, more especially regarding the physical qualifications of the students, as the Director may be in a position to furnish.

(xi) A list of private students, who may not succed in obtaing appointments, will be forwarded by the Director to the Inspector General of Forests, who will circulate the list amongst Durbars, Conservators, and other persons likely to be in need of the services of trained forest officials.

(xii) The appointment to the service of Government of passed private students depends on the existence of vacancies in the various circles, and even a stipendiary student has no claim to such appointment.

13. *Candidates in the Government Service*, who may be deputed to the School, will ordinarily be either—

(*a*) members of the Provincial Service (Forest Rangers) who desire to qualify themselves for further promotion in their own or to a higher class ; or

(*b*) members of the Subordinate Service (Foresters and other subordinate officials) similarly desirous of qualifying for promotion.

(i) Forest Rangers may be deputed by Local Governments, provided the candidates are certified, by the Conservator under whom they are serving, to possess sufficient knowledge of English and general education and ability to enable them to profit by the course. Such officers may be above 25 years of age, and need not pass the entrance examination. While at the School they will draw the pay of their grade, and the travelling allowances to which they may be entitled under the Civil Service Regulations.

(ii) Officers of the Subordinate Service may be deputed by Local Governments, provided that—

(*a*) they have been in that service for not less than three years ;

(*b*) they have passed the School entrance examination ;

(*c*) they are under 25 years of age ;

(*d*) they have executed the formal agreement referred to in Rule 17.

Such officers will, while at the School, draw the pay and travelling allowances of their grade in the service ; provided that the total amount sanctioned to meet the cost of their training, inclusive of travelling expenses, shall not be less than Rs. 735 in the case of students living in the native style, and Rs. 945 in the case of students living in European fashion (*vide* Rule 21).

14. *Students deputed by Native States* muy be admitted on the request of the State concerned ; provided that—

(*a*) they have passed the entrance examination of the School ;

(*b*) they have produced the certificates required for admission, specified in Rule 12 (i).

The Durbars of Native States sending students to the School shall, before the beginning of each term, or of each year if preferred, deposit with the Director a sum sufficient to meet the expenses of the Students. This sum, for the whole course, must not be less than Rs. 735 for students living in Native fashion and Rs. 945 for those living in European fashion (*vide* Rule 21).

*B.—Lower Class.*

15. There are also three categories of Students in the Lower Class—

(*a*) Private students.

(*b*) Students in Government service.

(*c*) Students deputed by Native States.

The rules for admission to the Lower Class are the same as those detailed in Rules 12, 13, and 14 for admission to the Upper Class, with the following exceptions :—

(i) Instead of the Entrance Examination, the candidate must furnish a certificate of having passed the Middle Class Examination in the North-Western Provinces and Oudh, or an equivalent standard in another Province as well as a certificate that he possesses a competent knowledge of Hindustani.

(ii) The cost of training will not be less than Rs 588 (*vide* Rule 21) for the whole course of 21 months.

(iii) The required deposit will be Rs. 84, and the caution-money Rs. 25.

*C.—General.*

16. No student of European or Eurasian extraction, not already in the permanent employment of Government or of a Native State, shall be be admitted into the Forest School if he is married, nor shall any such student, whether in the permanent employment of Government or of a Native State or not, marry whilst at the School or until he has joined a permanent appointment. A breach of this rule will render the student liable to dismissal from the School, or to forfeiture of any appointment in the Forest Service which may have been promised to him, or to which he may otherwise have a claim.

17. *Agreement and Security Bond.*—Officers of the Subordinate Service, deputed to the School by Local Governments under Rules 13 (ii) and 15, shall execute a formal agreement—the sureties for the fulfillment of which should be men of position and means—to continue in the Forest Service of the Local Government concerned for a period of not less than five years after passing out of the Forest School and on such rates of pay as may be in accordance with the existing organisation of the Department. A breach of this condition will render the defaulter and his sureties liable for the refund of the entire cost of the student's education at the School. The agreement and security bond shall be in the appended forms, and must be executed before the student is admitted to the School. The agreement will be signed by the student and, if he is a minor, by his father or guardian also; the bond by the student and two sureties. The amount of security to be taken will be—

| | | Rs. |
|---|---|---|
| For a Lower Class student ... | ... | 600 |
| „ an Upper Class Student | Native ... ... | 750 |
| | European ... | 1,000 |

The agreement and security bond need not be stamped.

The same rule shall be apply to private students who may be granted stipends under Rule 12 (ix), subject, however, to the proviso of Rule 12 (xii). Should any such student not be appointed to the Forest Service of Government at the end of of his School Course, his agreement and security-bond will be returned to him.

18. *Uniform, book and camp allowances.*—The Director is authorised to make deductions from the pay of Forest Ranger students under Rule 13 (i), or of students of the Subordinate Service under Rule 13 (ii) and 15, or from the stipends of private students under Rules 12, (ix) and 15, to the following amounts :—

| | | Rs. | | Rs. | |
|---|---|---|---|---|---|
| Lower Class Students ... | | 4 | monthly, or ... | 84 | in all |
| Upper Class Students | Native | 6 | „ ... | 126 | „ |
| | European | 8 | „ ... | 168 | „ |

in order to meet the following items of initial expenditure, *viz* :—

| | Upper Class. | | Lower Class |
|---|---|---|---|
| | Native. | European. | |
| | Rs. | Rs. | Rs. |
| Uniform and equipment ... .. | 20 | 50 | 20 |
| Books and instruments ... .. | 60 | 60 | 24 |
| Camp outfit ... ... ... | 46 | 58 | 40 |
| | 126 | 168 | 84 |

The Director will charge off in his accounts such portions of the above as may be necessary from time to time to meet expenditure on the items mentioned, until the whole of the amounts are exhausted, after which the student will be required to pay in cash for articles supplied.

19. *Travelling allowances of private students in receipt of stipends.*—Students holding stipends from Local Governments under Rule 12 (ix) are not entitled to travelling allowance ; but, as the tours entail greater expenditure in some months than in others, the Director is authorised to make a further monthly deduction from the stipends, of Rs. 5 from Upper Class Native students and Rs. 7 from Upper Class European students, and to disburse the amounts in the following manner :—

| | Native Students. | European Students. |
|---|---|---|
| | Rs. | Rs. |
| Monthly travelling allowances { Novr.-May, 1st year / Novr.-Mar. 2nd „ } | 4 | 8 |
| Or for 12 months ... | 48 | 96 |
| Special additional allowance for Hill tour | 22 | 16 |
| „ „ „ for Punjab „ | 35 | 35 |
| TOTAL ... | 105 | 147 |

20. Should the Conservator of a Circle from which any Government student of the Subordinate Service is deputed to the School, under Rule 13 (ii), prefer it, he can, subject to the orders of his Government, authorise the Director to pay travelling allowance to such student at the rates given in Rule 19, instead of at the rates allowed by the Civil Service Regulations. And in the case of Lower Class Government students, deputed to the School under Rule 15, he may similarly authorise the payment of travelling allowance at the following rates, instead of the rates permissible under the Civil Service Regulations :—

| | Rs. |
|---|---|
| Monthly travelling allowance at Rs 4. ... .. .. | 48 |
| Special hill tour allowance ... . ... | 16 |
| „ Punjab tour allowance ... ... | 20 |
| Total ... | 84 |

which rates are equivalent to a permanent travelling allowance of Rs. 4 per month for the whole course.

21. *Estimated expense of training.*—It has been calculated that, in addition to the amounts specified in Rule 18 for cost of uniform, books, &c., and camp-equipment, and in Rules 19 and 20

for travelling, the minimum monthly subsistence money for students comes to Rs. 20, 24, and 30, respectively ; so that the minimum pay and travelling allowances of Government students under Rule 13 (ii), and the minimum stipends for stipendiary students under Rule 12 (ix), should not be less than Rs. 35 and Rs. 45, respectively, nor should the minimum pay and travelling allowances of Lower Class students (Rule 15) be less than Rs. 28. Thus, the minimum cost of training will be as follows :—

| | Lower Class. | Upper Class. | |
|---|---|---|---|
| | | Native. | European. |
| | Rs | Rs. | Rs. |
| Subsistence money ... | 20 | 24 | 30 |
| Uniform, books, and camp outfits ... | 4 | 6 | 8 |
| Travelling allowance ... ... | 4 | 5 | 7 |
| Total per mensem ... | 28 | 35 | 45 |
| Or for the 21 months of course ... | 588 | 735 | 945 |

The same amounts should be taken as minima in calculating the allowances to be deposited on account of students from Native States under Rules 14 and 15, or provided by parents and guardians for the cost of training of private students.

## Section III.—Disciplinary Rules.

22. *Quarters.*—The Director will allot to students, on their arrival in Dehra, such quarters as may be available in the School buildings or in the houses rented by him for students' accommodation. The School quarters are tenable during the whole period of the students' course, and the rent is Rs. 2 monthly for each student, or Rs. 4 for each room. Students for whom there is no accommodation in quarters or in houses rented by the Director, or who may prefer it, can, with the permission of the Director, reside in the town in lodgings selected by themselves; but in that case the Director will accept no responsibility for the rent.

All students, living in quarters or in the rented houses, are expected to abide by such orders as the Director may issue from time to time for the purpose of ensuring cleanliness and sanitation.

No dogs are allowed in quarters, nor may dogs or horses be brought inside the School grounds.

Breakages of furniture, etc., in the quarters or School buildings must be paid for by the students. Students are responsible for the acts of their servants.

23. *Uniform.*—All students must wear the School uniform which consists of a suit of khaki drill with white-metal buttons, and a grey turban of prescribed pattern, for the hot weather, and of khaki serge with similar buttons for the cold weather and camp. Those students who become members of the Dehra Dun Mounted Rifles are, however, permitted to wear the undress uniform of the corps, which also consists of a suit of khaki drill, of pattern similar to that of the School. Students who are Volunteers will wear, as head-dress, a brown shikar hat while at the School, and the regular corps helmet when on parade. Native students may dispense with turbans, or wear other head-dress, only with the Director's special permission. Uniform must always be worn inside the School building. It must also be worn in the School grounds up to 5 P. M.

24. *Uniform and Camp Equipment.*—The uniform of members of the Dehra Dun Mounted Rifles may be obtained through the corps staff; that of other students through the Storekeeper of the School, on the Director's order. As camp equipment each student requires—

(1) A small tent, not larger than 10 feet × 8 feet.
(2) A camp bed.
(3) A small camp table.
(4) A camp chair or "morah."

These articles are made at the School and issued at cost price to students.

25. *Books and Instruments*—The list of books and instruments required by each student will be published by the Director from time to time. The articles must be purchased from the Director, who endeavours to obtain them of the best quality procurable, consistent with cheapness. No article will, however, be issued by the Storekeeper, except (*a*) on order of the Director, or (*b*) on cash payment.

Copies of the Forest Acts and Forest Code, as also surveying instruments and herbarium presses, are issued on loan, and students using them will be responsible for their safe-custody, and return.

26. *Leave.*—During the course of instruction, no student may leave Dehra without the written order of the Director. Nor may students, while in camp, leave the camp head-quarters without the written order of the Deputy-Director or the Instructor in charge. Subsidiary rules regarding leave will be made by the Director from time to time.

27. *Holidays.*—During the rains term, Saturday will usually be observed as a holiday or devoted to excursions. In camp, it will ordinarily be a half-holiday. Such of the usual gazetted holidays as are allowed will be notified as such from time to time.

28 *Punishments.*—Students are liable to the following punishments :—

(1) Reprimand by the teacher in class.

(2) Reprimand by the Director or the Deputy-Director at any time.

(3) Reprimand before a meeting, convened by the Director, of not less than three School officers, one of whom must be either the Director or the Deputy-Director. The proceedings of the meeting will be reported to the Conservator or the Native State deputing the student, or to his parents or guardians if he is a private student; and, if the meeting so decides, a note of them will be made on his final certificate.

(4) The Director, acting with the consensus of the meeting referred to under (3), has power to inflict, in addition, a fine to the extent of one-third of the salary or allowances of the student for a period not exceeding three months.

(5) The Director, acting with the consensus of a full meeting of the School officers presided over by himself, has power to dismiss any student for misconduct; and a student thus dismissed cannot be re-admitted to the School. The Director may remand any student who, in his opinion, is not sufficiently promising.

29. *Monthly Reports.*—A progress report on the work of each student will be issued monthly by the Director. It will record the number of marks obtained by the student at the last monthly examination, his application to his studies, and his conduct generally. It will be sent, for Government students or private students in receipt of stipends, to the Conservator of the Circle from which the student is deputed; for Native State students, to such person as the Durbar may direct; and for ordinary private students, to the parent or guardian concerned.

30. *Library.*—The books in the School Library are available for the use of students under such rules as the Director may make from time to time. Books of reference must be consulted in the library itself, and no books may be taken away except after application to the librarian and entry in a register.

31. *Museum.*—The Museum and Herbarium are also available for the use of students; but the objects in the museum may not be handled or removed without the express permission of the Director or the Deputy-Director Permission to consult the herbarium may be obtained from the Director or the Deputy-Director, but the plants must be kept in their order as arranged, and no sheets removed or altered without permission.

32. *Athletic Sports.*—The gymnasium and the tennis-courts will be available for the use of students during all recreation hours on week-days. Cricket and football may be played on the old parade ground. Students are recommended to join the School Athletic Club, the subscription to which is Rs. 4 yearly, and half-rates for those who do not play all the games.

## IV—REVIEWS

# The Madras Forest Administration Report for 1891-92.

In reviewing, last August, the Forest Reports of the Madras Presidency for 1891-92, we referred to the results of the system under which the Conservation had been pushed into the background in order that the control of the administration of the Department should be managed entirely by the Board of Revenue. There can be little doubt but that this has led to the increase of expenditure in the shape of clerical establishments who have. of course, to justify their own retention and maintain their appointments, and we cannot help thinking that this clerical staff is really at the bottom of the reasons for the great administrative mistake committed in allowing the professional agency of the Department to be set aside. Apparently, the matter has also attracted the attention, not only of the Government of India but of the Secretary of State, as will be seen from the following extract, to which we draw attention, from the Government of India Review.

"The record of the progress made during the year was for 'the first time compiled, from the various district reports, in the 'office of the Board of Revenue. The Report, especially in those 'parts of it where technical subjects, such as working-plans, 'natural reproduction, &c, are dealt with, is wanting, in a suffi-'cient summary of the more or less disjointed statements which are 'brought together but not reviewed in many of its pages. The Gov-'ernment of India are therefore pleased to observe that the pre-'vious procedure, under which each Conservator prepared a con-'solidated report for all the districts in his Circle, is to be restored. 'The submission of the Conservators' reports, with such brief re-'marks as may be necessary to draw attention to points requiring 'notice, will facilitate a comparison between the administrations 'and will tend to lessen the large amount of business which de-'volves upon the Board and to which the Secretary of State drew 'attention."

We may hope that with such a consensus of opinion against them, the Madras Government will now adopt the proposals of the Government of India, to which the writer in the 'Madras Mail,' whom we quoted in August referred, and adopt the plan of having a Central Committee of Conservators acting under the Presidency of the Revenue Secretary, to manage its forest affairs and to get rid at one sweep, of the cost of the interference of the Board of Revenue, and the grievance which the Conservators naturally feel at the lowering of their position.

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# Report on Forest Administration in the Jeypore State for 1892.

In our Number for September 1892, we reviewed the Jeypore Report for 1891, which Report was then prepared by Bhai Sadhu Singh. Bhai Sadhu Singh has since then returned to the Punjab and his place has been taken by Lala Shiva Bakhsh, who is the writer of the Report for 1892 The Control of the Jeypore Forest Department is now no longer under the State Engineer in Chief but under the State Council presided over by Babu Kanti Chunder Mukerji, C. I. E., Rao Bahadur, the Prime Minister, who it is said "takes a very keen interest in forest affairs." We have read Lala Shiva Bakhsh's introduction with great interest and we think it right to reproduce, as follows, a rather lengthy extract from them, as we think it fair to show that the teaching of the Forest School and the influence of British Forest Officers, has not been in vain and that there are some Native Foresters who carefully and well appreciate the advantages of forest conservancy and value of forests in dry regions like those of Jeypore.

## ADVANTAGES OF FOREST CONSERVANCY.

The advantages expected to be secured by forest conservancy in this State, as in the other provinces of the British Empire, are of two classes—direct and indirect. The direct advantages are easily defined. They comprise the provision of a permanent and sufficient supply of timber, wood, and other forest produce for local use, iron-smelting, and the trade generally. The indirect advantages are the influence of forests upon climate, the underground and surface-drainage: in a hilly country, forests protect the surface soil against erosion, and diminish the quantity of sand and silt carried down by rivers. They help to fix moving sands, afford shelter against winds particularly against the scorching ones of the hot season; and that during the dry season, well-stocked forests tend to increase the atmospheric moisture and dew in their immediate vicinity. For the direct advantages of

forest conservancy. it is of the greatest importance to produce on the smallest area the largest quantity possible of useful timber, wood, and other forest produce, and it is necessary to determine the yearly quantity which, under good management, can be produced permanently on a given area.

It is important to determine the rate at which useful and marketable forest produce, such as wood or timber, can be produced in different localities and under different systems of management. Without accurate knowledge of these matters we work in the dark.

Forestry is as yet a new business in the State, and in order to secure success at the beginning, it is necessary to deal with the problem of forest protection in its easiest form ; so at the outset the protection of compact areas of suitable size with convenient boundaries was undertaken. It is a fact that lands in the neighbourhood of well-stocked forests are more productive than those situate at a distance from the forest. It must be distinctly recognized that not only does the provision of fuel come within the legitimate scope of forest administration in Jeypore, but one of its most important duties will, in future, be to increase the supply of cattle-fodder, particularly during seasons of drought.

The importance of this feature of forest administration is not yet fully recognized. It is in this matter chiefly that forest conservancy may be expected to mitigate the disastrous effects of seasons of drought and famine The importation of grain can be facilitated by the construction of additional roads and railways, but cattle-fodder cannot, to the same extent, be distributed over the country ; it must either be produced on the spot in the vicinity of the villages, or the cattle must be driven away to places where pasture is available. The want of grass and the consequent mortality among cattle has always been one of the principal evils attending fodder famines, and this evil can, in many cases, be mitigated by forest conservancy. The lands in the immediate vicinity of well-stocked forests will have a more abundant, and at the same time a more permanent, supply of timber, firewood, branches of thorns for fences, leaves for manure, and of cattle-fodder, and they will have the advantage of heavier dew in the dry season, and of protection against dry scorching winds ; and in most cases they will have a more certain supply of water in streams, springs, wells, and tanks. In this manner forest conservancy, if properly understood and methodically carried out, will improve the condition of the lands enclosed within, and situated in the vicinity of, the forests, and will thus promote the extension of cultivation. The aim which should be steadily pursued in regard to the management of the wood and forest lands at the disposal of the Raj is to effect a sharp separation between fields, grazing grounds, and forests.

## GRAZING GROUNDS.

A more extensive management of the pasture lands is another subject which must be kept in view. In most of the States in Rajputana, extensive preserves of grass and brush-wood are maintained according to ancient custom, either as the property of the State, like the Ramnas of Bharatpore and Kishangarh, or as the property of the great nobles who own a large portion of the land in Meywar. During the terrible famine of 1867-68, while the cattle of the British districts of Ajmere and Merwara died or had to be sent away, these preserves, in several of the Native States of Rajputana, were of the greatest value in enabling the people to keep a portion of their cattle near their villages. In the fodder famine of 1891, grass was supplied to the Government at Ajmere from the Jeypore State birs, while the Jodhpore peasants for want of fodder emigrated to Jeypore and the adjacent British districts of Ajmere and Agra. In seasons of drought, pasture is available in the forest lands, when there is none in the open grazing grounds. It is not only that in such cases there is more grass under the shelter of the trees, but the leaves of the trees themselves serve as fodder. The growth of trees on grazing grounds combined with closing them against cattle in rotation, and the establishment of grass preserves to furnish cut grass during the dry season, in which cattle only graze after the grass has been cut, and which will be protected against fire, should have a treat. The growth of forest is primarily influenced by the climate, and in Rajputana the most important climatic factors in regard to forest growth are rainfall and atmospheric moisture.

## EFFECT OF FORESTS IN PROTECTING THE SOIL AND REGULATING SURFACE AND SUB-SOIL DRAINAGE.

Forests protect the soil on slopes and hills, and there is good ground for believing that they regulate the distribution of the rain-water which falls upon the ground and the surface and underground drainage. In this respect the action of forest is one, we believe, most beneficial in a tropical climate.

The action is that the foliage breaks the force of the rain, which therefore falls upon the ground more gradually and gently; the loss by evaporation is less; decayed leaves, moss, twigs, and other matter on the ground in the forest act as a sponge and prevent the rapid downflow of the water; the soil, which is permeated by the roots and is mixed with vegetable mould, is loose and facilitates the percolation of the water which comes out at a lower elevation in the shape of springs. Less soil is washed away from he hill sides, and less sand and silt are carried down by the rivers.

The effect of forest upon the moisture in the soil is, however, of a most complicated nature. For while, on the one hand, the evaporation of rain-water is diminished, there is, on the other hand, no doubt that, under certain circumstances, trees and forests tend to dry up the soil, the roots drawing up moisture often from great depths which is evaporated by the leaves. The rain which falls upon the catchment area divides itself into three unequal portions. The largest portion evaporates, while smaller quantities flow off on the surface, and a third portion sinks into the sub-soil, re-appearing at a lower level in springs and streams.

In a well-stocked forest a fourth portion is retained by the branches and foliage.

Alienation of Raj waste lands is also checked by forest administration.

## PRIVATE FORESTS.

Zemindars or other large proprietors whose forests have been devastated by reckless cutting or otherwise, or who may desire to conserve them in order to protect the water-supply in rivers or for other purposes, may be induced to apply for assistance in managing their forests. The Rajaji of Khetri has an intention of conserving his forests. The assistance may be given by the Thikana employing a separate officer, who will carry out the regulations for the management of the forests. When professionally trained and experienced rangers and foresters are available for the charge of private forests, their owners will be found willing enough to avail themselves of their services. When State forests are successfully maintained, the example of yielding a good and steadily increasing revenue to the State will induce private landholders to imitate the example thus set them.

At the time when Colonel Jacob, the State Engineer. gave up the general control of the Forest Department in the Jeypore State, which event was soon afterwards followed by the transfer to the Punjab of Bhai Sadhu Singh whose ardour in carrying out the original proposals made by Mr. Mc. A. Moir deserves the greatest praise, it was feared that the Forest Conservancy arrangements in the Jeypore State were likely to suffer.

From the present report, however. it seems that this has not been the case and this satisfactory state of affairs can only now be attributed to the great interest taken in the Forest work by the Prime Minister. In Forest matters especially, a steady and progressive policy in the matter of closing Forests to grazing and firing is of the greatest importance and reserves once closed should not again be opened until fit for it, except in the case of the most urgent famine arrangements.

In fact, too much stress cannot be placed on the great importance of closing altogether to grazing as large areas as are practicable in dry regions like Rajputana, as the amount of damage done by all kinds of animals, and especially browsers, reaches its maximum in such localities. The Jeypore State forests have scarcely changed in area during the year, they have now about 278 square miles or nearly 2 per cent of the area of the State. The forests are managed in four ranges and by degrees trained officers from Dehra are being employed in the management.

Out of the 278 square miles, 85 square miles more or less are closed against grazing and otherwise the whole area is under fire-protection which in 1892 was extremely successful, with almost no expenditure.

We note that there was a slight increase in the number of cases dealt with by the Courts or compounded and which amounted to 361 during the year, against 334 during the former year.

The number of cattle impounded amounted to 4,630 against 5,507 during the previous year. These figures would seem to indicate considerable energy on the part of the Forest protective establishment.

The financial results were also good, they shewed :—

| | | |
|---|---|---|
| Revenue | ... ... | Rs. 25,538 |
| Expenditure | ... ... | „ 10,310 |
| | Surplus ... | Rs. 15,228 |

Appendix B of the Report has a very useful list of trees and shrubs of the State classified according to the Vernacular and scientific names ; as also a list of fodder-yielding trees and sand binding plants, all of which lists testify to the activity and energy of the Superintendent, whom we congratulate on the excellent results and report he has succeeded in producing.

In conclusion, we note that two more students for the supervision of the State Forests are now under training at the Forest School at Dehra Dún and we venture to suggest that it would be of great advantage to the State pecuniarily and otherwise, to see that the services of properly trained and energetic men are retained, by alloting them a judicious run of promotion, as there is no doubt that the prospects of Forest School trained students in Government employ are much more favorable than those of Native States and this state of affairs naturally causes a good deal of discontent.

## V.—SHIKAR AND TRAVEL.

# Forest School Sports at Dehra Dun.

The Annual Sports of the Imperial Forest School were held at the old Parade Ground at Dehra, on Saturday afternoon, the 14th instant, and proved a great success. A fine, clear autumn day brought out everyone in Dehra to witness the various competitions which were keenly contested, the greatest interest being shown in them by the English contingent, as well as by the many Gurkhas, Sikhs, Pathans, and Hillmen that were present. Mr. Gamble, the Director of the Forest School, presided over the Sports, assisted by Mr. Smythies, the Deputy Director, Messrs. Gradon and Rogers, the Professors at the School, and Mr. Grenfell, Deputy Conservator, Saharanpur Division: they all worked hard to make the Sports a success, and were well repaid for their untiring efforts by the success of the meeting. The 100 yards was won easily by Langhorne, whose time would have run better had be been more pressed. The competition between Tweedie and Langhorne, in the Hurdle Race, was very keen and close; and in the half mile Pocock and Wood made a splendid race of it in excellent time.

The following are the various events and winners:—

I.—*Flat Race.* Distance 100 yards.

| | | | | |
|---|---|---|---|---|
| F. J. Langhorne | ... | ... | ... | 1 |
| R. L. Pocock | ... | ... | ... | 2 |
| S. J. Wood | ... | ... | ... | 3 |

Won easily by a yard. Time—11secs.

II.—*Long Jump.* One prize, open to whole school, and one to native students only.

| | | | | |
|---|---|---|---|---|
| R. L. Pocock | ... | ... | ... | 1 |
| Chinniah | ... | ... | ... | 2 |

The winner jumped 17 feet 5 inches; the second 17 feet ½ inch.

III.—*Hurdle Race.* Distance 120 yards over 10 flights of hurdles.

| | | | | |
|---|---|---|---|---|
| J. F. Tweedie | ... | ... | ... | 1 |
| F. J. Langhorne | ... | ... | ... | 2 |
| R. L. Pocock | ... | ... | ... | 3 |

Tweedie and Langhorne jumped each hurdle simultaneously the former touched the tape only 6 inches ahead. Time—18 $\frac{4}{5}$ secs.

IV.—*Throwing the Cricket Ball.*

| | | | | |
|---|---|---|---|---|
| T. I. Pocock | ... | ... | ... | 1 |
| P. Plunkett | ... | ... | ... | 2 |

In the first attempts Pocock and Plunkett were exactly equal, so they were given three more throws, and Pocock came out the winner with a throw of 95¼ yards.

V.—*Flat Race.* Distance 220 yards, for native students only.

| | | | | |
|---|---|---|---|---|
| Chinnian ... | ... | ... | ... | 1 |
| Rama Row ... | ... | ... | ... | 2 |
| Chintamon Vishwanath . . | | ... | ... | 3 |

Won by a yard, after a good race. Time—27$\frac{2}{5}$ secs.

VII—*High Jump.* One prize open to whole School, and one to native students only.

| | | | | |
|---|---|---|---|---|
| J. F. Tweedie | ... | ... | ... | 1 |
| Chinniah ... | ... | ... | ... | 2 |

Tweedie jumped 4 feet 11 inches, and Chinniah 4 feet 6 inches.

VIII.—*Flat Race.* Distance half mile. Open to whole School.

| | | | | |
|---|---|---|---|---|
| R. L. Pocock | ... | ... | ... | 1 |
| S. A. Wood | ... | ... | ... | 2 |
| Rama Row | ... | ... | ... | 3 |

Pocock came up at the end, and won a good race by a yard in 2min. 6½secs., almost a record time.

IX.—*Flat Race.* Distance 100 yards, for School servants.

| | | | | |
|---|---|---|---|---|
| Ram Kishen | ... | ... | ... | 1 |
| Pir Mahomed | ... | ... | | 2 |
| Amar Singh | ... | .. | | 3 |

The greatest interest was shown in this race. Time—11min. $\frac{4}{5}$ secs.

X.—*Flat Race.* Distance 100 yards, for 2nd P. W. O. Gurkha Bandsmen.

| | | | | |
|---|---|---|---|---|
| Keshab Singh | ... | ... | | 1 |
| Rattan Singh | ... | ... | ... | 2 |
| Dian Singh | ... | ... | ... | 3 |

A close race, won by a foot. Time—11$\frac{2}{5}$ secs.

XI.—*Tug-of-War,* Seniors *vs.* Juniors, 10 each side, 3 tries.

The Juniors won the first try, the Seniors the second; the third try was won by the Seniors rather easily, amidst the greatest excitement At the termination of the races, the prizes were presented to the winners by Mrs. Smythies.—*Pioneer.*

## VI.—EXTRACTS, NOTES AND QUERIES.

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# The Resin of Conifers.

The origin and properties of resin in coniferous timber have recently been investigated by Dr. H. Mayr, and he has succeeded in demonstrating several new and interesting points. The subject is treated rather fully in an article contributed by Dr. Mayr to the Zeitschrift für Forst und Jagdwesen for June, and his conclusions, some of which differ from those of previous investigators, are summarised as follows :—

1. Only in an invisible, and thus in the molecular form, in the plasma, can existing resin pass into an intercellular space. Therefore—

2. The cell wall is only permeable for resin so long as it is in process of formation.

3. All resin canal cells which subsequently belong to the permanent tissue of the wood, not resin secreting, epithelial cells, but partly store cells, as other parenchyma cells, partly secondary meristem cells (thin walled), are converted after a series of years into permanent cells ; therefore, it follows that a secretion of resin in the canals can only occur during the first year or two of the formation of the canal-carrying annual rings.

4. Finished cell-walls, whether lignified, thickened, or not, cannot be permeated by resin so long as the respective walls are saturated by water, and, as in the living tree, both sap and heartwood are always saturated, so it follows that—

5. All cell-walls of normal wood in the living tree are always free from resin.

6. All resin-holding spaces are surrounded by an impervious, continuous cell tissue, and, therefore, are completely isolated. The resin cavities are entirely closed in on all sides, and never open at the exterior in an uninjured tree.

7. There is, therefore, no spontaneous exudation of resin towards the surface ; every outflow of resin is pathological ; where, *primo aspectu*, a spontaneous outflow appears to occur, as on the buds of different conifers, a close investigation shows that it is connected with exudation into an intercellular space, or with the drying-up of the outer layers, thus in the case of the latter a pathological occurrence.

8. All resin canals of the wood stand vertically over one another, and the horizontal always arise from the vertical; should the place of origin have become lignified with the respective year ring, then the connection between the two forms is effected where the horizontal and vertical canals occasionally cross.

9. With the conversion of sap into heartwood the resin-canals are filled up by tyloses, so that a subsequent flow of resin from the sap to the heartwood, or *vice versa* (as with the economic extraction of resin), is impossible.

10. The resin must be a bye-product in the formation of coniferin, one of the usually occurring substances in the resin-yielding conifers; the resin does not arise from the coniferin, but simultaneously with it and starch may be considered as the raw material for the formation of both.

11. Neither by normal nor pathological causes (chemical decomposition, or fermentation through fungi) does a conversion of coniferin lignin, or cellulose (the constituents of the cell-walls), into resin occur.

12. Should a gradual diminution of the watery contents of the cell-wall occur through mechanico-pathological causes (wounds, punctures by insects, etc.), the resin partly takes the place of the water, and can, through unwounded and turgescent neighbouring wood, also fill the "lumina" of the cells. Should fresh wood remain in the ground, as, for example, the stumps of felled trees, the resin is gradually forced by the surrounding moisture into the interior of the stump Under favourable conditions as in stagnant water or bogs, the resin occurs in the rotting wood as resin-hydrate in a crystalline form.—*Gardiners' Chronicle.*

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# Pice Packets of Quinine.

We have received a copy of the last Cinchona Report of the Government of Bengal with samples of the pice packets of quinine which are now for sale at all Post Offices throughout the Lower Provinces.

The following extract from Dr. G. King's Report shews what has been done.

*Sale of Quinine at Post-offices.*—The chief event of the year has been the organization of the system by which quinine, made up in doses of five grains, is offered for sale at most of the Post-Offices within the Province of Bengal. Each dose is made up in a neat closed paper envelope, and is sold for one pice. Each packet carries the royal arms as a guarantee of genuineness, together with brief instructions in the vernacular. To encourage the Post-Office officials to push the sale of these

packets, a small commission is allowed, and considerable facility is offered for replenishing of stocks by post-masters; the parcel-rates for transmission, however, bear rather heavily on the scheme, and I trust some means of lightening them may soon be found. When the scheme was suggested last year, it very soon became obvious that one of the first conditions of success would be to find some means of making up the packets by which adulteration and loss from pilfering and careless weighment might be reduced to a minimum. It was therefore decided by Government to make this matter over to the Jail Department. The quinine is therefore made over from the factory to that department in bulk, and by prison labour it is subdivided into pice packets, 1,400 of which go to each avoirdupois pound. The Jail Department distributes these packets to the post-masters and collects the proceeds of the sales at the various Post-Offices. A dose of pure quinine is by this means put within the reach of any person within the province who has a pice to buy it with. Thus at last, after thirty years of effort, has the end been attained which the Government set before itself when the growth of the medical cinchonas was begun in British India. That end was thus expressed in an early Government resolution on the subject:—"To put the only medicine that is of any use in the cure of the commonest and most fatal of Indian diseases within the reach of the poorest." Of the provinces usually supplied with quinine from the Mungpoo Factory, Bengal is the only one into which this pice-packet system has as yet been introduced. It is believed that, should the various provinces under the Government of India adopt the system, large demands will be made on the cinchona plantation, and extended planting operations may have to be undertaken. To meet such, Government have, in addition to the land reserved in the neighbourhood of Mungpoo, a reserve on the Bhootan frontier in Engo Valley, in which ground has not yet been broken.

The Bengal Government express great satisfaction with the arrangement and note that 475lbs of quinine were thus made up into packets for sale during the year. The paper packets are small envelopes of strong paper about 2½ by ¼ inches and each contains 5 grains of sulphate of quinine. The price is so calculated as only just to leave to Government a very small profit on its plantation. This is shewn by the fact that while the *gross* revenue of the year was Rs. 1,17,768 the *net* revenue was only Rs 3,171. We wish every success to the new venture which ought to be a useful one for Forest Officers, for they can now carry about with them in convenient form, sufficient to meet the many demands for quinine which every forest officer who has had to serve in unhealthy regions is so well accustomed to. We hope that it will not be long before the other Local Governments of the Bengal Presidency follow the lead of Bengal in taking the matter up.

## IIV.-TIMBER AND PRODUCE TRADE.

**Statement of average selling rates of timber and bamboos in Meerut, Cawnpore, Bulandshahr, Pilibhit, Bareilly, and Moradabad for the quarter ending 30th September 1893.**

| Description. | Timber Scantlings per score. | | Bamboos per 100 score. | | REMARKS. |
|---|---|---|---|---|---|
| | From | To | From | To | |
| | R. A. P. | R. A. P. | R. A. P. | | |
| **MEERUT.** | | | | | |
| Sal 10′ Tors (Poles) ... | 8 0 0 | 18 0 0 | ... | ... | |
| Sal & Sain, &c., Karris, 12′× 5″ × 4″ ... | 25 0 0 | 40 0 0 | ... | ... | |
| Sal bed posts, 7′ × 2½″ × 2½″ ... | 10 0 0 | 12 0 0 | ... | ... | |
| Bamboos of 9′ to 10′ per 100 score ... | ... | ... | 40 0 0 | 100 0 0 | |
| **CAWNPORE.** | | | | | |
| Sal 10′ Tors (Poles) ... | 5 0 0 | 6 0 0 | ... | ... | |
| Sal, and Sain &c., Karris, 12′× 5″×4″ ... | 25 0 0 | 100 0 0 | ... | ... | |
| Sal bed posts, 7′ × 2½″ × 2½″ ... | 15 0 0 | 19 0 0 | ... | ... | |
| Bamboos of 9′ to 10′ per 100 score | .. | .. | 25 0 0<br>30 0 0<br>50 0 0 | 30 0 0<br>50 0 0<br>100 0 0 | |
| **BULANDSHAHR.** | | | | | |
| Sal 10′ Tors (Poles) ... | ... | ... | ... | .. | |
| Sal, and Sain, &c., Karris, 12′× 5″ × 4″ ... | ... | ... | ... | ... | |
| Sal bed posts, 7′ × 2½″ × 2½″ ... | ... | ... | ... | .. | |
| Bamboos of 9′ to 10′ per 100 score ... | ... | ... | 76 0 0 | 76 0 0 | |
| **PILIBHIT.** | | | | | |
| Sal 10′ Tors (Poles) ... | 40 0 0 | 70 0 0 | ... | ... | |
| Sal and Sain, &c. Karris 12′× 5″ × 4″ ... | 30 0 0 | 40 0 0 | ... | ... | |
| Sal bed posts 7′ × 2½″ × 2½′ .. | 5 0 0 | 6 4 0 | .. | .. | |
| Bamboos of 9′ to 10′ per 100 score ... | ... | ... | 60 0 0 | 100 0 0 | |
| **BAREILLY.** | | | | | |
| Sal 10′ Tors (Poles) ... | 5 0 0 | 10 0 0 | ... | .. | |
| Sal & Sain, &c , Karris, 12′× 5″×4″ | 25 0 0<br><br>40 0 0 | 35 0 0<br>50 0 0<br>60 0 0 | ...<br>..<br>... | ...<br>...<br>... | |
| Sal bed posts 7′ × 2½″ × 2½″ ... | 10 0 0 | 15 0 0 | ... | | |
| Bamboos of 9′ to 10′ per 100 score ... | ... | ... | 50 0 0 | 137 0 0 | |
| **MORADABAD.** | | | | | |
| Sal 10′ Tors (Poles) ... | 20 0 0 | 25 0 0 | ... | ... | |
| Sal, & Sain, &c., Karris, 12′× 5″×4″ ... | 30 0 0 | 50 0 0 | ... | ... | |
| Sal bed posts 7′ × 2½″×2½″ ... | 8 0 0 | 10 0 | ... | ... | |
| Bamboos of 9′ to 10′ per 100 score ... | ... | ... | 50 0 0 | 100 0 0 | |

# Churchill and Sim's Circular.

*October 5th, 1893.*

EAST INDIA TEAK.—The deliveries for the first three quarters of this year amount to 10,118 loads, as compared with 7,656 loads for the nine months of 1892, and with 11,392 loads for the same period of 1891. In the past September the delivery was 1835 loads, and the figures for that month in 1892 and in 1891 were 661 loads and 1551 loads respectively. Prices have remained about stationary, and could well be advanced without danger of checking the growing consumption by excessive cost. The Dock stock is considerably reduced.

ROSEWOOD—Is difficult of sale, as although stocks are not heavy, the demand is very dull.

SATINWOOD. Logs.—The demand remains very quiet and sales difficult to effect: for *planks* and *boards* there is no enquiry.

EBONY.—The slightly improved demand has now cleared Importer's Stocks, but prices remain low.

## *PRICE CURRENT.*

| | | | | |
|---|---|---|---|---|
| Indian Teak | per load | £9-10s. | to | £15-10s. |
| Satinwood | „ ton | £5 | to | £12 |
| Rosewood | „ „ | £5 | to | £9 |
| Ebony | „ „ | £5 | to | £7 |

## MARKET RATES OF PRODUCTS.

(*Tropical Agriculturist, October 1893.*)

| | | | | |
|---|---|---|---|---|
| Cardamoms, | per lb. | 2s. | to | 2s.6d. |
| Croton seeds | per cwt. | 20s. | to | 27s.6d. |
| Cutch | „ | 20s. | to | 23s. |
| Gum Arabic, Madras | „ | 50s. | to | 90s. |
| Gum Kino | „ | 100s. | to | 140s. |
| India Rubber, Assam | per lb. | 1s.7d. | to | 2s.3d. |
| „ Burma | „ | 1s.7d. | to | 1s.11d. |
| Myrabolams, Bombay | per cwt | 9s.6d. | to | 11s.3d. |
| „ | „ | 7s.9d. | to | 9s. |
| „ , Godavari | „ | 7s.6d. | to | 8s. |
| Nux Vomica, good | „ | 8s. | to | 11s. |
| Orchella, Ceylon | „ | 22s. | to | 28s. |
| Redwood | per ton | £3. | to | £3-10 |
| Sandalwood, logs | „ | £35 | to | £55 |
| „ chips | „ | £9 | to | £30 |

# Cawnpore Price Current

*October 25th, 1893.*

| | Per Maund. | | | | |
|---|---|---|---|---|---|
| | Rs. | As. | | Rs. | As. |
| Aonla fruits—dried ... ... | 0 | 12 | to | 1 | 0 |
| „ leaves dried and bruised ... | 1 | 12 | to | 2 | 0 |
| Babul bark ... ... | 0 | 9 | to | 0 | 10 |
| Bahera ... ... | 1 | 12 | to | 2 | 0 |
| Stick Lac ... ... | 15 | 0 | to | 30 | 0 |
| Myrabolams ... ... | 3 | 0 | to | 3 | 12 |
| Moonj grass ... ... | 1 | 4 | to | 1 | 8 |
| Babul Gum ... ... | 8 | 0 | to | 12 | 0 |
| Mixed Gum ... ... | 6 | 0 | to | 8 | 0 |

## VIII.—EXTRACTS FROM OFFICIAL GAZETTES.

1.—Gazette of India.

12*th October*, 1893.—No. 1059-F.—Furlough for eight months, under Article 340 (*b*) of the Civil Service Regulations, is granted to Mr. E. P. Dansey, Conservator of Forests, Bengal, with effect from 1st March 1894, or the subsequent date on which he may avail himself of it.

19*th October*, 1893.—No. 1111-F.—Privilege leave for two months, under Articles 277 and 291 of the Civil Service Regulations, is granted to Mr. J. S. Gamble, Conservator of Forests, School Circle, North-Western Provinces and Oudh, and Director of the Imperial Forest School, Dehra Dun, with effect from 1st November, 1893.

2.—Madras Gazette.

15*th September*, 1893.—No. 493.—P. Sadasiva Row, late plantation supervisor, Forest Department, South Arcot District, having been convicted of criminal breach of trust by a public servant and dismissed from his apointment, is hereby declared ineligible for further employment in the public service.

19*th September*, 1893.—No. 476.—Mr. P. M. Lushington, District Forest Officer, Godavari, is granted furlough on medical certificate for one year, with effect from the 13th instant, under article 340 (*a*) of the Civil Service Regulations.

23*rd September* 1893.—No. 482.—

| Name of Officer. | District. | Nature of charge. | Remarks. |
|---|---|---|---|
| Mr. A. B. Jackson, Assistant Conservator of Forests, First grade. | Godavari | District Forest Officer. | To join speedily. |
| Mr. T. N. Hearsey, Extra Assistant Conservator of Forests, Third grade. | Anantapur | Do. | To act until further orders. |

29*th September*, 1893.—No 491.—

| Name and designation of Officer. | Present grade. | Grade to which promoted. | Nature of promotion. | Remarks showing cause of vacancy, &c. |
|---|---|---|---|---|
| Mr. H. B Bryant, Acting District Forest Officer, South Coimbatore. | Assistant Conservator of Forests, Second grade. | Assistant Conservator of Forests, First Grade. | Permanent | With effect from the 18th July, 1893. |

30*th September*, 1893.—Mr. A. Srinivasa Chamberlain, Forester on Rs 40, South Coimbatore, to be Ranger on Rs. 50.

Mr. A. G. Van Haeften, Ranger on Rs. 100, from Madura to the Nilgiri District. Mr. J. W. Ryan, Ranger on Rs. 50, from Nilgiris to North Malabar.

*25th September*, 1893.—M. Balaji Singh, Forest Ranger Anantapur. District, is granted privilege leave for two months, with effect from the 8th September 1893.

*1st October*, 1893 —To M. Shamsuddin Sahib, Ranger, 4th Grades Salem District, for six months, from the 7th September 1893, under article 369, of the Civil Service Regulations.

Mr J Tapp, Ranger, 5th Grade, North Arcot District, to act at Ranger, 4th Grade, from the 7th September, *vice* Ranger M. Shamsuddin Sahib on sick leave

*8th October*, 1893 —N. S Veeracharlu, Forest Ranger, Kurnool, is transferred to Bellary District as a temporary measure—To join at the expiration of his leave.

*12th October*, 1893 —No. 517.—Mr. T. P. Peake, Deputy Conservator of Forests, Madras, has been permitted by the Right Honorable the Secretary of State for India to return to duty within the period of his leave.

*17th October*, 1893 —Ordered that the following promotions be made with effect from the 7th September :—

1. Ranger N. Balaji Singh to act as Ranger 4th Grade, until 1st December, 1893.

2 Forester T. Arumuga Mudaliar to act as Ranger, 5th Grade, *vice* Mr. Thompson promoted, or until further orders.

3 Forester S. Ramaswami Aiyah to act as Ranger, 5th Grade, until 6th March, 1894.

4. Forester H. P Ramachendra Mudaliar to act as Ranger, 5th Grade, until 1st December, 1893.

3.—Bengal Gazette.

*28th September*, 1893 —Messrs W. R. Woodrow and T. R. D. Bell, Deputy Conservators of Forests, respectively delivered over and received charge of the office of the Divisonal Forest Officer, Dhárwár on the forenoon of 21st September, 1893

*23rd September*, 1893 —Mr. V. D. P. Ribeiro, L C E., Extra Assistant Conservator of Forests, Fourth Grade, and Bassein Sub-Division Officer, delivered over and Mr. Husanalli Mahomedalli, acting Extra Assistant Conservator of Forests, Fourth Grade, received charge of the Bassein Sub-Division Office on the 16th of Seprember 1893, before noon

*12th October*, 1893 —Mr. A. N Master, Extra Assistant Conservator of Forests, Fourth Grade, and Mr. W. F. D. Fisher, Assistant Conservator of Forests, Second Grade, delivered over and received charge of the Divisional Forest Office, Panch Mahále, on the 5th of October 1893, in the afternoon.

*18th October*, 1893.—No 7600 —Mr. B. J. Haselden, D visional Forest Officer, Kánara (C. D.); passed an examination in Kánarese on 7th October 1893.

*18th October* 1893.—Mr. K. B Phadke, Extra Assistant Conservator, Fourth Grade, delivered over and Mr. A. N. Master, L C.E., Extra Assistant Conservator, Fourth Grade, received charge of the Sháháپur Sub-Division Office on the 9th October 1893, before noon.

4.—BENGAL GAZETTE

16*th October* 1893.—No. 4338—The following changes are ordered in the Controlling Staff of the Bengal Forest Department:—

On being relieved of the charge of the Jalpaiguri Forest Division by Mr. H. H. Haines, Officiating Deputy Conservator of Forests (on privilege leave), Mr. C. C. Hatt, Assistant Conservator of Forests, is attached to the Direction Division for special duty.

On return from the furlough granted to him in Notification No. 704For,. dated 9th February 1893, Mr. W. M. Green, Deputy Conservator of Forests, is appointed to the charge of the Kurseong Forest Division.

On being relieved of the charge of the Kurseong Forest Division by Mr. W M. Green, Deputy Conservator of Forests, Mr. E. E Slane, Extra-Assistant Conservator of Forests, is attached to the Sundarbans Forest Division.

19*th October* 1893.—No. 4348.—Mr. W. H. Lovegrove, Officiating Deputy Conservator of Forests, in charge of the Chittagong Forest Division, is granted leave for three months under article 291 of the Civil Service Regulations, with effect from the 17th September 1893, or any subsequent date on which he may have availed, or may avail himself, of it.

19*th October* 1893,—No. 4349 —Mr. R Quinnell, Extra Assistant Conservator of Forests, Palamau Division, is transferred to the charge of the Chittagong Forest Division, during the absence on leave, of Mr W. H Lovegrove, or until further orders

Babu Guru Das Chatterjee, Forest Ranger, Koderma Range (Direction Division), is transferred to the charge of the Palamau Division.

5.—N.-W. PROVINCES AND OUDH GAZETTE.

3*rd October* 1893,—No. 2941.—Mr. E. L Haslett, Extra Assistant Conservator of Forests, attached to the Naini Tal Forest Division of the Central Circle, privilege leave for one month, with effect from the 15th October 1893.

11*th October* 1893.—No. 3059.—Mr B. B Osmaston, Officiating Deputy Conservator of Forests, in charge of the Bahraich Forest Division, on being relieved by Mr. B. A Rebsch, to the charge of the Pilibhit Forest Division of the Oudh Circle.

11*th October* 1893.—No. 3060 —Mr. Keshava Nand, Extra Assistant Conservator of Forests, in charge of the Pilibhit Forest Division, on being relieved by Mr. B B. Osmaston, to be attached to the Direction Division of the Oudh Circle.

11*th October* 1893,—No. 3061.—Mr. J M. Blanchfield, Extra Assistant Conservator of Forests, in charge of the Ganges Forest Division of the Central Circle, on being relieved by Mr. W. Shakespear, to be attached to the Gorakhpur Forest Division of the Oudh Circle.

23*rd October* 1893.—No. 3255.—Mr. E L. Haslett, Extra Assistant Conservator of Forests, on return from leave, to be attached to the Direction Division of the Central Circle.

6.—PUNJAB GAZETTE.

*22nd September*, 1893 —No. 489.—Under the provisions of Section, 2 of the Indian Forest Act VII of 1878, the Hon'ble the Lieutenant-Governor is pleased to appoint the Officer Commanding the Native Cavalry Regiment stationed at Umballa for the time being to be a Forest Officer in respect of Bîr Chhapar (or Dhantauri) and Bîr Surja which have been declared to be Reserved Forests by Notification No. 435, dated 14th August, 1893.

*4th October*, 1893 —No. 505.—Messrs. F. O. Lemarchand, Deputy Conservator of Forests, and C. Somers Smith, Assistant Conservator of Forests, respectively made over and received charge of the Kangra Forests Division, on the afternoon of the 7th September, 1893, consequent on the former's departure on the privilege leave sanctioned in Notification No. 422, dated the 5th August, 1893.

*9th October*, 1893.—No. 513.—Mr. G. S Hart, Officiating Deputy Conservator of Forests, Simla Hill Tracts Division, is granted 22 days' privilege leave, under Article 291 of the Civil Service Regulations, with effect from the 20th October, 1893 or such subsequent date as he may avail himself of it.

*11th October*, 1893.—No. 519.—Bhâi Sâdhu Singh, Extra Assistant Conservator of Forests, returned to duty on the afternoon of the 17th September, 18' 3, from the privilege leave granted him in Punjab Government Notification No 426 of the 9th August, 1893.

7.—CENTRAL PROVINCES.

*2nd October*, 1893.—No. 4,600.—Notification No. 4290, dated the 12th instant, granting two months' privilege leave to Mr. J. J. Hobday, Extra-Assistant Conservator of Forests, is hereby cancelled at his own request.

*10th October*, 1893.—No. 4757.—Mr. Mahomed Kadir Baksh, Extra Assistant Conservator of Forests, who was posted to the charge of the Nimar Forest Division by Notification No, 3,943, dated the 22nd August, 1893, assumed charge of his duties from Mr. R. C. Thomson, Extra-Assistant Conservator of Forests, on the afternoon of the 9th ultimo.

*17th October*, 1893.—No. 4870.—Mr. Syed Ali Muttaki Khan, Senior Forest Ranger, temporarily posted to the charge of the Narsighpur Forest Division, to work under the immediate orders of the Deputy Commissioner, by Notification No. 3946, dated the 22nd August-1893, assumed charge of his duties from Mr. W. King, Deputy Conservator of Forests, on the forenoon of the 11th September, 1893.

*17th October*, 1893.—No. 4871.—Mr. A. M. F. Caccia, Assistant Conservator of Forests, Betul, availed himself, on the afternoon of the 13th September, 1893, of the three months' privilege leave granted him by Notification No. 4,196, dated the 7th idem, making over charge of his duties to Mr. R. C. Thompson, Extra-Assistant Conservator.

*21st October*, 1893.—No. 4933.—The Officiating Chief Commissioner is pleased to invest the undermentioned Forest Officers with the powers defined in Section 71, Act VII of 1878 (the Indian Forest Act), to be exercised within the limits of their respective Divisions :—

| *Name.* | *Designation.* |
|---|---|
| Mr. A. W. Blunt | ... Officiating Deputy Conservator of Forests. |
| Mr. P. H. Clutterbuck | .. Officiating Deputy Conservator of Forests. |
| Mr. H. S. Ker Edie | ... Assistant Conservator of Forests. |
| Mr. N. C. McLeod | ... Extra-Assistant Conservator of Forests. |
| Mr. J. J. Hobday | .. Extra-Assistant Conservator of Forests. |
| Mr. Ramchunder Krishna | Extra-Assistant Conservator of Forests. |

*26th October*, 1893.—No 5,007.—Privilege leave for fourteen days, under Article 291 of the Civil Service Regulations, is granted to Mr. H. A. Hoghton, Deputy-Conservator of Forests, Seoni, with effect from the date on which he may be permitted to avail himself of it.

8.—BURMA GAZETTE.

*22nd September*, 1893.—No. 368.—The undermentioned officer has been permitted by Her Majesty's Secretary of State for India to return to duty within the period of his leave :—

Mr. J Copeland, Deputy Conservator of Forests.

*23rd September*. 1893.—No. 24.—In accordance with the orders passed by the Chief Commissioner, this office Notification No. 23, dated the 11th September, 1893, recording the suspension of Mr. C. W. B Anderson, Extra Assistant Conservator of Forests, on probation, is hereby cancelled.

*25th September*, 1893.—No. 8.—Mr. T. A Hauxwell, Deputy Conservator of Forests, made over, and Mr. J. Messer, Assistant Conservator of Forests, received charge of the Agency and Salween-Ataran divisions, and the Tenasserim Forest Surveys, on the afternoon of the 22nd September, 1893.

*26th September*, 1893.—No 370.—The following temporary alterations in rank are ordered in the Forest Department :—

(1). With effect from the 11th July, 1893, the date on which Mr. Branthwaite availed himself of privilege leave :—

Mr. C. W. A. Bruce, Assistant Conservator, 1st grade, to officiate as Deputy Conservator, 4th grade.

Mr. A. M. Burn-Murdoch, Assistant Conservator, 2nd grade to officiate as Assistant Conservator, 1st grade.

(2). With effect from the 31st July, 1893, the date on which Mr. Tottenham availed himself of privilege leave :—

Mr. H. N. Thompson, Assistant Conservator, 2nd, officiating 1st grade, to officiate as Deputy Conservator, 4th grade.

(3). With effect from the 1st August-1893, the date on which Mr. Toussaint availed himself of privilege leave :—

Mr. J. Messer, Assistant Conservator, 2nd, officiating 1st grade, to officiate as Deputy Conservator, 4th grade.

(4). With effect from the 5th August, 1893, the date on which Mr. Aplin availed himself of privilege leave :—

Mr. J. C. Murray, Deputy Conservator, 3rd grade, to officiate as Deputy Conservator, 2nd grade.

Mr. H. Jackson, Deputy Conservator, 4th grade, to officiate as Deputy Conservator, 3rd grade.

Mr. H. H. Forteath, Assistant Conservator, 2nd, officiating 1st grade, to officiate as Deputy Conservator, 4th grade.

(5). With effect from the 15th August-1893, the date on which Mr. Tottenham returned from leave.

Mr. H. H. Forteath, Assistant Conservator, 2nd, officiating Deputy Conservator, 4th grade, to officiate as Assistant Conservator, 1st grade.

*2nd October*, 1893 —No. 373.—In consequence of the departure on privilege leave of Mr. T. H. Aplin, Deputy Conservator of Forests, Mr. H. Slade, Deputy Conservator of Forests, 2nd, is appointed to officiate as Deputy Conservator of Forests, 1st grade, with effect from the 5th August 1893.

*7th October*, 1893.—No. 381.—In supersession of this department Notification No. 363, dated the 20th September 1893, and under the provisions of Articles 277 and 282 *(a) (1)* of the Civil Service Regulations, Mr. C. W. B. Anderson, Extra Assistant Conservator of Forests, is granted privilege leave for three months with effect from the 4th September 1893.

No. 382 —The undermentioned officer has been granted extension of leave by Her Majesty's Secretary of State for India .—

Mr. J Copeland, Deputy Conservator of Forests, 16 days' extraordinary leave without pay.

*12th October*, 1893,—No 384 —The following temporary alterations in rank are ordered in the Forest Department, with effect from the 23rd September 1893, the date on which Mr. Hauxwell availed himself of privilege leave :—

(1). Mr. H B. Anthony, Deputy Conservator, 4th, officiating 3rd grade, to officiate as Deputy Conservator, 2nd grade.

(2). Mr. C. L Toussaint, Deputy Conservator, 4th grade, to officiate as Deputy Conservator, 3rd grade.

(3). Mr G R. Blackwell, Deputy Conservator, 4th grade, to officiate as Deputy Conservator, 3rd grade.

(4). Mr. H H. Forteath, Assistant Conservator, 2nd, officiating 1st grade, to officiate as Deputy Conservator, 4th grade.

*13th October*, 1893.—No. 385.—In exercise of the powers conferred by section 34, sub section (2), clause *(h)* of the Upper Burma Forest Regulation, 1887, the Chief Commissioner prescribes the following form of license for the assessment and collection of the royalty on jadestone and amber in supersession of the form numbered as Appendix VIII to the Rules published in Revenue Department Notification No. 140, dated the 19th April 1893.

*16th October*, 1893 —No. 398.—The undermentioned officer has been granted extension of leave by Her Majesty's Secretary of State for India :—

Mr. H. Carter, Assistant Conservator of Forests, three months' leave on medical certificate.

*16th October*, 1893 —No. 25 —Mr. C. W. B. Anderson, Extra Assistant Conservator of Forests, is held to have availed himself of the three months' privilege leave granted in Revenue Department Notification No. 381 (Forests), dated the 7th October 1893, with effect from the 4th September 1893

*19th October*, 1893.—No. 404.—Mr. C. W. Palmer, Deputy Conservator of Forests, is reduced to the bottom of the second grade of Deputy Conservators.

9.—ASSAM GAZETTE.

*28th September*, 1893.—No. 9566G.—In consequence of the return from privilege leave of Mr. R. H. M. Ellis, Deputy Conservator of Forests, First Grade (provisional), the following reversions are notified with effect from the 13th September 1893.

Mr. J. L Pigot, Officiating Deputy Conservator of Forests, First Grade (provisional), to be Deputy Conservator of Forests, Second Grade (provisional), and to be seconded.

Mr. D. P. Copeland, Officiating Deputy Conservator of Forests, First Grade (provisional), to be Deputy Conservervator of Forests. Second Grade (provisional).

Mr. H. G. Young, Officiating Deputy Conservator of Forests, Second Grade (provisional), to be Deputy Conservator of Forests, Third Grade (provisional).

Mr T. J. Campbell, Officiating Deputy Conservator of Forests, Third Grade (provisional), to be Deputy Conservator of Forests, Fourth Grade.

*3rd October*, 1893 -- No. 9655G.—Furlough for six months, under article 340 *(a)* of the Civil Service Regulations, is granted to Mr. W. F. Lloyd, Deputy Conservator of Forests, with effect from the 24th September 1893.

*6th October*, 1893.—No. 9725G.—Mr. R. H. M. Ellis, Deputy Conservator of Forests, on return from privilege leave, is posted to the Lakhimpur Forest Division, and placed in charge of the Sibsagar Forest Division in addition to his own duties.

10.—HYDERABAD RESIDENCY GAZETTE.

*20th September* 1893 —No. 994-F.—Furlough for two years, under Article 371(*b*) of the Civil Service Regulations, is granted to Mr. J. Ballantine, Deputy Conservator of Forests, 3rd grade, Berar, on deputation to His Highness the Nizam's Dominions, with effect from 6th June 1893 Mr. Ballantine availed himself of subsidiary leave from 10th to 15th idem, both dates inclusive.

11.—MYSORE GAZETTE.

*29th September* 1893,—No, 6424—G. F. 291-92.—Under Article 173 of the Mysore Service Regulations, Mr. B. Ramswami Iyer, Sub-Assistant Conservator of Forests, Kadur District, is granted casual leave of absence for 15 days with effect from such date as he may avail himself of the same.

2. During the absence on leave of Mr. Ramswami Iyer, the following arrangements are ordered :—

(i) Mr. B. Hira Singh, Forest Probationer, to be in charge of the Forest Department of the Kadur District, until further orders.

(ii) Mr. M. G. Rama Rao, Forest Probationer, to be in charge of the Shikarpur Forest Sub-Division.

(iii) Mr. Appaiya, Forest Probationer, is transferred from the Mysore to the Shimoga District.

ESTABLISHED 1881.

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# APPENDIX SERIES

OF

# THE INDIAN FORESTER.

[This product is described in Dr. Watt's Dictionary of Economic Products, Vol. I. A. 695—705.]

# "EAST INDIAN WALNUT."

## (ALBIZZIA LEBBEK.)

—o—

The object of this hand-book is to bring to prominent notice a timber which has been occasionally sent from the Andaman Islands to London, where it has commanded a ready sale. It has a beautifully patterned grain, and makes very pretty furniture.

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The Siris tree (*Albizzia Lebbek*), whose timber is called "East Indian Walnut *" in the English market, is a large, deciduous, spreading tree, belonging to the natural Order Leguminosæ, found wild or cultivated in most parts of India; growing in the evergreen forests in the Sub-Himálayan Tract from the Indus eastward, in Bengal, Central and Southern India, Burma, and the Andaman Islands, and ascending to 5,000 feet in altitude.

The following account of the wood is given by Gamble in his 'Manual of Indian Timbers':—"Sapwood large, white; heartwood dark brown, hard, shining, mottled with deeper coloured, longitudinal streaks. The annual rings in trees grown in the Panjáb are marked by a distinct line.

"Pores large, not numerous, often subdivided and enclosed in patches of softer whitish tissue, which are frequently arranged in short bands. Pores prominent on a longitudinal section. Medullary rays fine, very numerous."

The growth of the tree, which is said to attain a height of 40—60 feet with a girth of 6—8, and at times 10—12 feet, is exceedingly rapid during the first few years, and Brandis says, in his 'Forest Flora of North-West and Central India,' that trees in the Panjáb have 2¾ feet girth in 12 years, 4½ feet in 30 years, and that trees at Sakhar in Sind 17 years old have reached 5 to 6 feet in girth. This, as pointed out by Gamble, would give from 1 to 3 rings per inch of radius, which is very fast.

The weight of the wood is said to be 40 to 60lb per cubic foot. It seasons, works, and polishes well, and is fairly durable. Its value may be inferred from the fact that the Burmese Government fixed a higher tax upon the felling of Kuk-ko (*Albizzia Lebbek*) than for Teak or any other tree.

The wood is used (in India) for picture-frames, sugarcane-crushers, oil-mills, furniture, well curbs, canoes (Burma), and wheel-work; in South India for boats. In the Andaman Islands, where trees of large size are procurable, it is utilised for building, and especially for house-posts. In the Deccan the wood is considered as being of excellent quality. In Northern India it is considered unlucky to employ it in house building. (*Drury, Roxburgh*, etc.)

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* The true Walnut of India is *Juglans regia*, which is very largely used on the Himálayas (*e.g.*, at Simla) for ornamental carving; but, though some excellent planks have been exported to Europe from Kulu, Chamba, and Kashmir, the timber does not as a rule compare favourably with American Walnut.

The Deputy Conservator of Forests, Andaman Islands, in reply to a circular recently issued by Mr. Ribbentrop, Inspector General of Forests, stated that "small quantities of Koko timber have occasionally been sent to London with the Padauk*, and have commanded a ready sale. It makes pretty furniture, having a beautifully patterned grain, and works up well when carved. Unfortunately we could not promise a continuous supply from the Andamans; otherwise, as the wood sells equally well with Padauk, we should have exported it regularly."

The London sales of the timber from the Andaman Islands in 1890-91, were 211 cubic feet or 4 tons.

Burrs of *Albizzia Lebbek*, like those of any other furniture wood, increase in value with the intricacy and rarity of the design, and the size of the burr. The price of such burrs, which are invariably sliced up into veneer, is frequently ten to twenty times that of the plain wood, and as much as a hundred times the value of the ordinary wood has been paid for extremely curious and unique burrs.

The possibility of creating a regular export trade in "East Indian Walnut" from India appears to be well worthy of the consideration of the Forest Department as well as of Timber merchants in Europe and India.

Specimens of the timber have been sent to the Imperial Institute from the following localities:—

Andaman Islands.
Thayetmyo Division, Upper Burma.
Tenasserim (where the tree is reported to grow sporadically, and never to occur in large numbers).
Terai Forests, Darjeeling District, Bengal.
Satara District, Bombay.
Poona " " "
Surat " " "
West Khandesh " "
North Kanara " "
South Arcot District, Madras.
Bellary " "
Ganjam " "
Malabar " "

Arrangements have also been made for the preparation of some specimens of Indian carving in the timber for the Imperial Institute.

EDGAR THURSTON,

*Offg. Reporter on Economic Products*

*to the Government of India.*

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* See 'Hand-book of Commercial Products,' No. 1.

G. I. C. P. O.—No. 64 R. & A. D.—22-8-93.—3,020.—J. D'C.